C21.5 : 947/3

Vol. 947 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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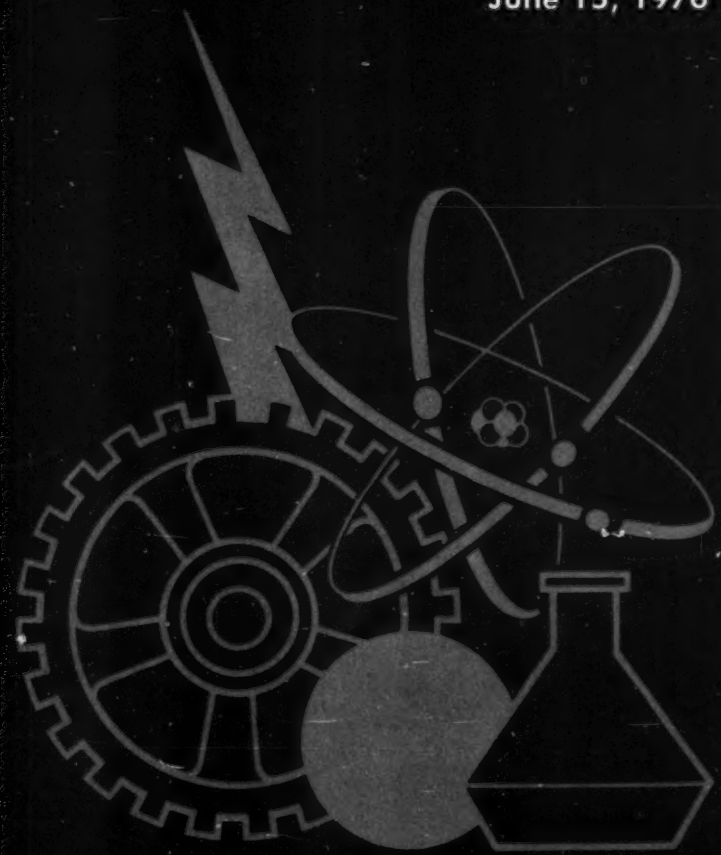
PATENTS

June 15, 1976



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 15, 1976 Volume 947 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Public Advisory Committee for Trademark Affairs

Open Meeting

In accordance with section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92-463), announcement is made of the following committee meeting.

The Public Advisory Committee for Trademark Affairs will meet from 9:30 a.m. to 5 p.m. on June 15, 1976 at the United States Trademark Association, 6 East 45th Street, New York, N.Y. 10017.

The Committee was established in 1970 to advise the Patent and Trademark Office on steps which can be taken in order to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuous source of knowledge from the private sector to the government in the field.

The agenda for the meeting is:

(1) Establishment of an agenda and plans for a meeting of the committee in the Fall of 1976.

(2) Discussion of expanding the committee membership.

The meeting will be open to public observation; approximately 15 seats will be available for the public on a first come first served basis. If time permits, oral comments by the public of 3 minutes on each topic within the above agenda items will be allowed. Any comments or suggestions relating to the agenda items should be submitted in writing before June 7. Further, comments and suggestions will be accepted after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request 60 days after the meeting.

Inquiries may be addressed to Patricia M. Davis, Room 11C17, Crystal Plaza Building 3, Telephone: 703-557-3881.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: May 12, 1976.

DAVID B. CHANG,
Acting Assistant Secretary for Science & Technology.

[FR Doc. 76-14744; Filed 5-19-76; 8.45 am]

PATENT NOTICES

Certificates of Correction for the Week of June 15, 1976

3,251,563	3,913,070	3,934,396	3,943,388
3,311,928	3,914,036	3,934,407	3,943,404
3,379,948	3,914,322	3,935,021	3,943,489
3,648,819	3,914,674	3,935,037	3,943,660
3,654,071	3,917,206	3,935,426	3,943,690
3,717,063	3,917,220	3,935,677	3,943,707
3,721,963	3,917,403	3,935,773	3,943,771
3,767,677	3,917,469	3,935,976	3,943,785
3,799,953	3,918,251	3,936,289	3,943,821
3,801,084	3,918,580	3,936,539	3,943,879
3,801,569	3,918,783	3,937,070	3,944,067
3,815,060	3,919,057	3,937,107	3,944,591
3,816,462	3,919,183	3,937,443	3,944,616
3,818,045	3,920,708	3,937,621	3,944,850
3,821,255	3,921,135	3,937,998	3,944,925
3,823,138	3,922,404	3,938,363	3,945,079
3,832,176	3,923,533	3,938,435	3,945,084
3,838,078	3,923,873	3,938,565	3,945,183
3,847,736	3,924,164	3,938,624	3,945,489
3,853,626	3,925,794	3,938,716	3,945,717
3,856,774	3,925,846	3,938,766	3,945,725
3,873,505	3,925,963	3,938,878	3,945,726
3,875,481	3,926,482	3,939,043	3,945,860
3,876,684	3,926,602	3,939,078	3,945,946
3,876,705	3,926,789	3,939,098	3,946,205
3,879,669	3,927,311	3,939,354	3,946,217
3,879,688	3,927,491	3,939,633	3,946,370
3,880,849	3,927,579	3,939,816	3,946,579
3,883,362	3,927,676	3,939,879	3,946,639
3,885,031	3,928,793	3,939,953	3,946,691
3,885,995	3,929,777	3,940,357	3,946,976
3,886,748	3,929,824	3,940,418	3,947,181
3,887,526	3,930,121	3,940,440	3,947,315
3,888,625	3,930,233	3,940,585	3,947,342
3,889,919	3,930,265	3,941,013	3,947,425
3,890,233	3,930,358	3,941,050	3,947,452
3,890,668	3,930,423	3,941,091	3,947,589
3,891,855	3,930,812	3,941,222	3,947,673
3,894,413	3,931,081	3,941,529	3,947,708
3,896,401	3,931,181	3,941,591	3,947,876
3,896,521	3,931,390	3,941,629	3,948,134
3,896,824	3,931,554	3,941,705	3,948,540
3,900,501	3,931,988	3,941,773	3,949,074
3,901,595	3,932,457	3,941,893	3,949,115
3,902,040	3,932,675	3,942,077	3,949,471
3,903,023	3,932,827	3,942,529	3,949,521
3,903,648	3,933,204	3,942,552	3,950,295
3,908,431	3,933,524	3,942,741	3,952,586
3,910,702	3,933,786	3,943,143	
3,912,662	3,934,213	3,943,202	

Dedication

3,418,896.—*Donald C. Rideout*, Huntingdon, Pa. REFLECTIVE MARKERS AND REFLECTIVE ELEMENTS THEREFOR. Patent dated Dec. 31, 1968. Dedication filed Apr. 13, 1976, by the assignee, *Prismo Universal Corporation*.

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

3,402,657.—*John T. Potter*, Plainview, *Thomas P. Foley*, Huntington, and *Carmine J. Antonucci*, Uniondale, N.Y. HIGH SPEED BELT PRINTER WITH PRINTING SLUG SUPPORTING MEANS. Patent dated Sept. 24, 1968. Disclaimer filed Apr. 21, 1976, by the assignee, *Potter Instrument Company, Inc.*

Hereby enters this disclaimer to claims 14 and 15 of said patent.

3,425,613.—*Frederick Reisfeld*, Commack, N.Y. SYSTEM FOR CONTROLLING THE STARTING AND STOPPING OF A CAPSTAN. Patent dated Feb. 4, 1969. Disclaimer filed Apr. 21, 1976, by the assignee, *Potter Instrument Company, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,460,570.—*Ernest H. Bucknell* and *Irving A. Ward*, Los Angeles, Calif. BALANCED CONTROL MIXING VALVE. Patent dated Aug. 12, 1969. Disclaimer filed Feb. 23, 1976, by the assignee, *Pearl White Bletcher*, part interest.

Hereby enters this disclaimer to her entire interest in all claims of said patent.

3,464,216.—*Lee A. Turzillo*, Bath, Ohio. METHOD AND MEANS FOR FORMING CAST-IN-PLACE REINFORCED CONCRETE PILE. Patent dated Sept. 2, 1969. Disclaimer filed Apr. 21, 1976, by the inventor.

The term of this patent subsequent to Jan. 16, 1984, has been disclaimed.

3,782,253.—*Frans Van Hekken*, Lancaster, Pa. COLOR TELEVISION PICTURE TUBE SCREENING METHOD. Patent dated Jan. 1, 1974. Disclaimer filed Mar. 26, 1976, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3 and 5 of said patent.

3,934,294.—*Walter Vornberger*, Tewksbury, Mass. LASTING MACHINE AND METHOD. Patent dated Jan. 27, 1976. Disclaimer filed Apr. 26, 1976, by the assignee, *International Shoe Machine Corporation*.

Hereby enters this disclaimer to claims 5 and 6 of said patent.

3,937,804.—*Thomas James Delaney*, Piscataway, and *William Grant Pierson*, Flanders, N.J. TOOTHPASTE. Patent dated Feb. 10, 1976. Disclaimer filed Feb. 17, 1976, by the assignee, *Colgate-Palmolive Company*.

The term of this patent subsequent to Feb. 10, 1993, has been disclaimed.

3,951,685.—*Marvin L. Kronenberg*, Cleveland Heights, Ohio. NONAQUEOUS CELL UTILIZING A 3Me2Ox-BASED ELECTROLYTE. Patent dated Apr. 20, 1976. Disclaimer filed Apr. 20, 1976, by the assignee, *Union Carbide Corporation*.

The term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 8, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-2-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates: Herbicides; Poisons; Medicines; Cosmetics; Sterolds; Oxo and Oxy; Quinones: Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-31-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-7-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-2-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	4-1-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-23-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-22-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	11-7-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-5-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing: Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	10-6-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco: Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-16-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-2-75

Expiration of patents: The patents within the range of numbers indicated below expire during May 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,884,634 to 2,588,678 inclusive
Plant Patents..... Numbers 1,829 to 1,837 inclusive

REISSUES

JUNE 15, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

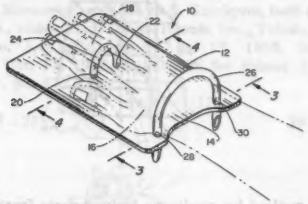
Re. 28,855
SWIM TRAINING PADDLE

Anthony James Montrella, P.O. Box K, Lakewood, Calif. 90714

Original No. 3,765,042, dated Oct. 16, 1973, Ser. No. 283,321, Aug. 24, 1972. Application for reissue Aug. 26, 1974, Ser. No. 500,724

Int. Cl.[2] A63B *31/02*

U.S. Cl. 9—307 6 Claims



1. A swim training paddle comprising:

a base composed of a rigid sheet material, said base having a fore end and an aft end, [said aft end of said base being relieved,] a first pair of apertures formed within said base adjacent said aft end;

a second pair of apertures formed within said base intermediate said ends but nearer said fore end than said aft end;

a first flexible tubing to be conducted through said first pair of apertures forming a loop to be located *approximately* about a swimmer's wrist; and

a second flexible tubing to be conducted through said second pair of apertures forming a single loop to be located solely about the middle finger of the swimmer's hand, [whereby the swimmer's hand is fixedly positioned upon the paddle with the pivotal movement of the hand about the wrist being substantially unhindered due to the relieving of said base, and] whereby the most efficient position of the paddle as it moves through the water is most sensitive to the swimmer due to the narrow fulcrum about the middle finger.

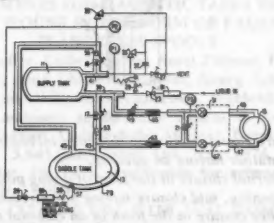
Re. 28,856
LOW-LOSS CLOSED-LOOP SUPPLY SYSTEM FOR TRANSFERRING LIQUIFIED GAS FROM A LARGE CONTAINER TO A SMALL CONTAINER

Kenneth R. Leonard, Boulder, Colo., assignor to Cryogenic Engineering Company, Denver, Colo.

Original No. 3,710,584, dated Jan. 16, 1973, Ser. No. 83,460, Oct. 23, 1970. Application for reissue July 18, 1974, Ser. No. 489,518

Int. Cl.[2] F17C *13/00*

U.S. Cl. 62—54 34 Claims



1. A low-loss method of filling a container for liquified gas from a supply system comprising the steps of:

transferring liquid from a first vessel into a second vessel, and transferring vapor from said second vessel to said first vessel whereby the pressure between said first and second vessels remains equalized as said liquid is transferred;

isolating said first vessel from said second vessel;

equalizing the pressure between said second vessel and said container for liquid gas;

connecting said first vessel to said container for liquified gas to permit vapor to flow therebetween;

connecting said second vessel to said container for liquified gas so that said liquid from said second vessel flows into said container for liquified gas, and maintaining the connection between said first vessel and said container for liquified gas to permit vapor from said container for liquified gas to flow into said first vessel.

Re. 28,857
APPARATUS FOR PRODUCING STITCH BONDED FABRIC

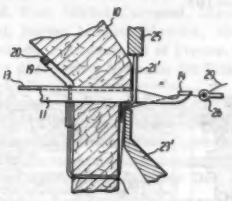
Arno Edgar Wildeman, Altrincham, England, assignor to Cosmopolitan Textile Company, Ltd., Winsford, England

Original No. 3,760,607, dated Sept. 25, 1973, Ser. No. 172,032, Aug. 16, 1971. Continuation-in-part of Ser. No. 867,331, Oct. 17, 1969, Pat. No. 3,646,780. Application for reissue Aug. 15, 1974, Ser. No. 497,732

Claims priority, application United Kingdom, June 30, 1971, 30616/71

Int. Cl.[2] D04B *23/10, 21/14;* D04H *1/52*

U.S. Cl. 112—438 8 Claims



1. An apparatus for producing a stitched bonded fabric from a fleece, said apparatus comprising a frame, a series of needles mounted in a spaced relation on said frame in a position to penetrate the fleece, a hook formation at the end of each needle, the hook formation being adapted to gather loops of fiber from the fleece upon withdrawal of the needle from the fleece, a corresponding number of thread guides mounted in the same plane as that of the needles and being reciprocally movable transversely on said frame to place threads on the hook formation at the end of each of said needles after penetrating said fleece, a rod positioned in each of said needles and being adapted to be moved partially through said fleece independently of said needles for mating engagement with said hook formations, a retention bar located below the level of the needles, and a series of support pins mounted on said frame and having their free ends cranked and positioned behind said retention bar to allow a thread on transverse movement of one of said thread guides to slide freely over the hook formation of one needle to the adjacent needle, whereby tricot stitches are formed and are locked into the fabric.

7. A textile comprising a fleece having a plurality of loose fibers, and a system of interlocking stitches of yarn having interlocked thread loops on one face of said fleece and connecting thread legs on the other face of said fleece, said yarn being

locked against removal from the fleece by entanglement of said yarn and loose fibers in said stitches.

Re. 28,858

SELECTIVE GAS PHASE FILTER MATERIAL

Elmer Francis Litzinger, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Original No. 3,716,063, dated Feb. 13, 1973, Ser. No. 75,773, Sept. 25, 1970. Application for reissue Feb. 7, 1975, Ser. No. 547,977

Int. Cl.[2] A24B *15/02*; A24F *7/04*; B01D *27/00*

U.S. Cl. 131—267 **12 Claims**

1. An improved tobacco smoke filter material comprising [at least 100 mg. of] a porous particulate carrier impregnated with a poly(alkyleneimine) alkanoate, wherein from about 2 to 6 percent by weight alkanoate is deposited on the carrier based on the total weight of the alkanoate and carrier, said poly(alkyleneimine) alkanoate having a pH from about 6.0 to 7.6, and wherein each of said carrier particles has a pore diameter of from about 0.1 to 2.0 microns, a surface area of from about 1 to 15 square meters per gram and a pore volume no less than about 0.3 cubic centimeter per gram.

Re. 28,859

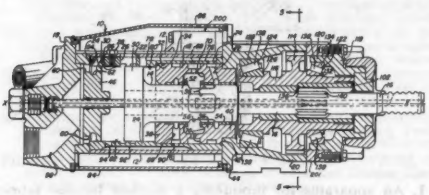
ROCK DRILL

Richard W. Beaumont, Dallas, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Original No. 3,666,024, dated May 30, 1972, Ser. No. 59,290, July 29, 1970. Application for reissue Oct. 1, 1973, Ser. No. 402,318

Int. Cl.[2] B25D *9/00*

U.S. Cl. 173—105 **12 Claims**



11. In a rock drill, the combination comprising: an elongated body member having a chamber extending longitudinally therein; a hammer piston having a head portion and a reduced diameter stem portion; said piston being reciprocable within said chamber for percussively actuating a striking bar by engagement of said stem portion with said striking bar upon movement of said piston from a first portion of said chamber to a second portion of said chamber; first passageway means in said body member adapted to be connected to a fluid pressure source; second passageway means in said stem portion in constant open communication with said first passageway means during at least a major portion of the reciprocable travel of said piston; third passageway means in said body member openly communicating between said second passageway means and a piston impact portion of said chamber only when said piston is moving through said first portion of said chamber; and fourth passageway means in said body member openly communicating with said second passageway means and a piston retracting portion of said chamber only when said piston is moving through said second portion of said chamber.

Re. 28,860

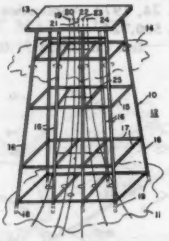
CURVED OFFSHORE WELL CONDUCTORS

Peter W. Marshall, New Orleans; Peter Arnold, Kenner, and Francis P. Dunn, New Orleans, all of La., assignors to Shell Oil Company, Houston, Tex.

Original No. 3,687,204, dated Aug. 29, 1972, Ser. No. 70,101, Sept. 8, 1970. Application for reissue Jan. 26, 1973, Ser. No. 326,706

Int. Cl.[2] E21B *7/04*; E02B *17/00*

U.S. Cl. 175—9 **30 Claims**



1. A method for producing hydrocarbons from a subterranean hydrocarbon-bearing formation located beneath the floor of a body of water, said method comprising the steps of:

installing a platform structure on the floor of said body of water above said formation;

extending at least one well conductor downwardly with respect to said platform structure, then curving said conductor outwardly and downwardly through said platform structure above the floor of said body of water in a manner maintaining a relatively smooth bore throughout substantially the entire extent of said conductor;

drilling via said conductor down through said floor and into fluid communication with said formation; and

producing formation fluids from said formation via said conductor.

Re. 28,861

SAFETY MEDICINE BOTTLE CLOSURE

Samuel Hall, Jr., Brooklyn, N.Y., assignor to Plastic Container Corporation, Brooklyn, N.Y.

Original No. 3,473,681, dated Oct. 21, 1969, Ser. No. 777,723, Nov. 21, 1968. Application for reissue May 23, 1975, Ser. No. 580,207

Int. Cl.[2] B65D *55/02*, *85/56*; A61J *1/00*

U.S. Cl. 215—204 **2 Claims**

8. A safety container closure assembly including,

(a) a container having an opening,

(b) an internal closure in the form of a plug positioned within said opening, said closure having a key recess therein,

(c) an outer closure in the form of an external cap positioned over said opening,

(d) said external cap having a skirt integral therewith and depending from the top of said cap, the interior of said skirt

carrying an annular bead which snaps over a complimentary bead on the outer periphery of container opening,

(e) a combination thumb abutment-key integral with and extending substantially horizontally outwardly from said skirt at the lower portion of the skirt, said thumb abutment-key functioning as a tab against which the thumb is pressed in a generally upwardly direction to remove the said external cap from the container and functioning additionally as a key for cooperation with the said key recess of said internal closure to thereby permit said internal closure to be removed from its position within the opening of said container.

Re. 28,862

EASY OPEN MEANS FOR BOTTLES AND THE LIKE

Frederik A. Siemonsen, and Alfred L. Garriques, both of Richmond, Va., assignors to Owens-Illinois, Inc., Toledo, Ohio

Original No. 3,462,036, dated Aug. 19, 1969, Ser. No. 587,170, Oct. 17, 1966. Application for reissue Aug. 18, 1971, Ser. No. 172,735

Int. Cl.[2] B65D *41/32*

U.S. Cl. 215—255 **29 Claims**

1. In combination, a container having an open end for dispensing product means disposed in said container, and a [one-piece] closure member secured to said open end of said container to close said open end, said closure member having a top portion disposed over said open end and a depending peripheral rim portion disposed around said container at said open end thereof to secure said closure member to said container, said closure member having a tear section integral therewith throughout the entire juncture of said tear section with the remainder of said closure member and provided with two edges that join together at adjacent ends thereof to define one end of said tear section substantially at the central part of said top portion with at least one edge thereof extending from said top portion to the free edge of said rim portion and with the other edge always [progressively] diverging away from said one edge from said adjacent ends thereof to the other ends thereof, and a ring pull tab means secured to said tear section at said top portion of said closure member and having a finger-receiving opening passing therethrough to facilitate the pulling of at least said one edge of said tear section from said closure member.

Re. 28,863

GUIDE ELEMENTS FOR MAGNETIC TAPES WOUND OR TO BE WOUND IN THE FORM OF PACKS ON FLANGELESS SPOOLS

Norbert Schaeffer, Ludwigshafen; Horst Fitterer, Heidelberg-Hasenleiser; Karl Uhl, Frankenthal; Georg Schnell, Ludwigshafen, and Wilhelmus Andriessen, Wachenheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Original No. 3,841,582, dated Oct. 15, 1974, Ser. No. 208,704, Dec. 16, 1971. Application for reissue Apr. 17, 1975, Ser. No. 569,315

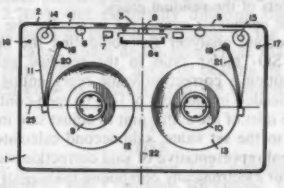
Int. Cl.[2] G03B *1/04*; G11B *15/32, 23/04*

U.S. Cl. 242—199 **13 Claims**

1. In a magnetic tape assembly, the combination comprising:

a pair of tape-supporting flangeless spools rotatable to unwind tape off a pack on one spool and wind tape onto a pack on the other spool, said tape passing between the packs around guide means in the form of a loop, and

b. at least one guide element movable substantially radially to one of said spools and in the plane of rotation of said spools, at least part of said guide element being arranged between the pack and the outermost winding generally at a tangent to said pack, having a guide face which is substantially flat longitudinally of said outermost winding,



thereby providing continuous surface contact over a substantial length of said face between said face and the inside of said outermost winding when said tape is in motion, having adjacent that end of the guide face at which said outermost winding merges with said pack, a margin which is at least as close to the pack as said face so that said outermost winding is guided smoothly and virtually tangentially to said pack at said margin, and having guide flanges extending outwardly above and below said outermost winding.

Re. 28,864

PROCESS AND APPARATUS FOR AUTOMATED REGULATION OF SULPHUR PRODUCTION UNITS

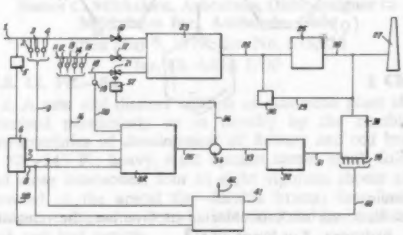
Guillaume Andral, Pau; Michel Carmassi, Mazeres-Lezons; Bernard Louvel, Buros; Jacques Maurice, Mourenx, and Georges Vandesande, Artagnon, all of France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Original No. 3,871,831, dated Mar. 18, 1975, Ser. No. 391,478, Aug. 24, 1973. Division of Ser. No. 207,790, Dec. 14, 1971, abandoned. Application for reissue Oct. 22, 1975, Ser. No. 624,778

Claims priority, application France, Dec. 18, 1970, 70.45812

Int. Cl.[2] G01N *7/00*; C01B *17/16*;

U.S. Cl. 23—255 R **10 Claims**



1. A device for the automatic regulation of a sulphur unit that produces sulphur by the oxidation of a hydrogen sulphide-containing gas by means of a free oxygen-containing gas, said gases being fed to the inlet of the sulphur unit through suitable inlet pipes and said sulphur unit liberating residual gases containing H_2S and SO_2 through a residual gas pipe, said device comprising:

a first analyzer for automatically analyzing the H_2S-containing gas fed to the inlet of the sulphur unit for providing a signal representative of the H_2S content of said gas,

a first calculator connected to receive the signal provided by said first analyzer for computing the theoretical flow of free oxygen-containing gas to be fed to the inlet of the sulphur unit to keep the $H_2S:SO_2$ molar ratio in the residual gases to a set value and for providing an output signal representative of said theoretical flow,

sampling means for continuously taking samples of the residual gases,

a second analyzer for automatically analyzing said samples for providing signals representative of the H_2S and SO_2 contents of the residual gases,

a second calculator connected to receive the signals from the second analyzer for computing the instantaneous $H_2S:SO_2$ molar ratio in the residual gases and for computing a correction value representing the correction needed in the flow of free oxygen-containing gases to the inlet of the sulfur unit to adjust said instantaneous ratio to the set value, said second calculator providing a signal representative of said correction value,

means for electronically combining the signals provided by said first and second calculators to produce a resulting signal representing their sum, and means responsive to said resulting signal for automatically controlling the flow of free oxygen-containing gas to the inlet of the sulphur unit.

Re. 28,865

SELECTIVE DEHALOGENATION

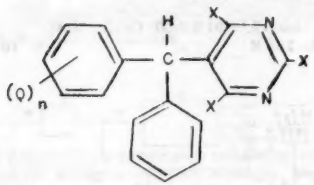
Jack B. Campbell, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Original No. 3,880,854, dated Apr. 29, 1975, Ser. No. 468,943, May 10, 1974. Continuation-in-part of Ser. No. 286,507, Sept. 5, 1972, abandoned. Application for reissue July 30, 1975, Ser. No. 600,247

Int. Cl.² C07D *239/00*

U.S. Cl. 260—251 R 4 Claims

1. The process of selectively dehalogenating the pyrimidyl ring of a compound of the formula



wherein

at least one of X is chlorine or bromine, the remainder hydrogen; [or lower alkyl]

Q is chlorine or fluorine; and

n is an integer from 1 to 5,

by contacting the compound with hydrogen in the presence of Raney nickel catalyst,

in methanol as the solvent,

in the presence of a hydrogen halide acceptor selected from the group consisting of tri(C_1–C_4 alkyl)amines and pyridine, at a temperature within the range of from about ambient room temperature to about 60°C., at a hydrogen pressure of from about 14 pounds per square inch to about 60 pounds per square inch.

Re. 28,866

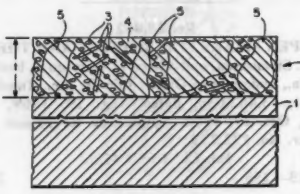
MAGNETIC RECORDING COATING

Joseph E. Haefele; Cecil R. Hawkins, and Ronald E. Kubec, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,843,404, dated Oct. 22, 1974, Ser. No. 289,892, Sept. 18, 1972. Continuation of Ser. No. 44,284, June 8, 1970, abandoned. Application for reissue Oct. 8, 1975, Ser. No. 620,671

Int. Cl.² H01F *10/02*

U.S. Cl. 428—336 4 Claims



1. A magnetic recording medium compising ferromagnetic and alumina particles dispersed in a binder as a unitary coating upon a non-magnetic substrate, each of the alumina particles disposed in said binder to be substantially equal to the thickness of the medium to form a solid barrier between the surface of the medium and the underlying non-magnetic substrate and present in an amount not above 5% by weight of the ferromagnetic and alumina particles.

Re. 28,867

MOVING OBJECT COMMUNICATION CONTROL SYSTEM

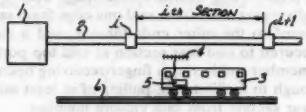
Takeshi Baba, Tokyo; Kenji Shibuya, Ohmiya; Tetsuro Maruhama, Amagasaki; Tsuneo Nakahara, Nishinomiya, and Kenichi Yoshida, Sakai, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Original No. 3,629,707, dated Dec. 21, 1971, Ser. No. 845,167, July 28, 1969. Application for reissue Feb. 5, 1973, Ser. No. 329,650

Claims priority, application Japan, July 30, 1968, 43-54099

Int. Cl. H04b *1/00*

U.S. Cl. 325—51 7 Claims



1. A communication system between mobile and a wayside stations, said mobile stations traveling on a track divided in sections by means of an open-type transmission line paralleling the track, a frequency selection and conversion device for each section along said open-type transmission line and connected thereto at the proper position to define the length of each section, means to transmit a series of first lower frequency carriers on said open-type transmission line at a low loss from said wayside station, said carriers allotted respectively to each specific section of said open-type transmission line, said selection and conversion devices operable to select and convert their respective first lower frequency carrier to a first higher frequency carrier for leaky transmission from said transmission line to a mobile station on the corresponding track section, an antenna for each mobile station for receiving and transmitting signals to said open-type transmission line.

PLANT PATENTS

GRANTED JUNE 15, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,906
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed May 15, 1975, Ser. No. 577,891
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly as to uniqueness by the combined characteristics of daisy inflorescence type with moderate longitudinal petal roll in opening stages, flat inflorescence form not known to reflex, diameter across face of inflorescence up to 4.0 inches at maturity, orange bronze ray floret color with minimal color oxidation under fall, winter, and spring light conditions, medium green disc floret color with minimal color oxidation under fall, development, uniform nine week flowering response, very tall plant height, semi-upright branching habit, high percentage gradeout in top grades (SAF standards), and thin and weak peduncles during high light, high temperature periods (June through September).

3,907
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed May 15, 1975, Ser. No. 577,892
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct cultivar of chrysanthemum plant particularly characterized as to uniqueness by the combined characteristics of decorative inflorescence type, semi-incurved inflorescence form not known to reflex, diameter across face of inflorescence from 4.0 to 5.5 inches at maturity, golden yellow ray floret color devoid of bronze tinging, uniform eight week flowering response, short plant height, semi-upright branching habit, and by its adaptability to a wide range of container sizes due to responsiveness of height to day length and B–9.

3,908
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed May 15, 1975, Ser. No. 577,921
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—77 1 Claim

1. A new and distinct cultivar of chrysanthemum plant characterized particularly by the combined characteristics of decorative inflorescence type and flat inflorescence form, 4 to 5.5 inches diameter across face of inflorescence at maturity, uniform eight week flowering response, short plant height, semi-upright branching habit, and its adaptability due to responsiveness of height to day length and B–9.

3,909
CLIMBING ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91762

Filed June 24, 1975, Ser. No. 589,866
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—4 1 Claim

1. A new and distinct variety of rose plant of the climber class, substantially as herein shown and described, characterized particularly as to novelty by being substantially identical with its parent variety "Town Talk" (Plant Pat. No. 2,709), but essentially differing therefrom by its climbing habit of growth evidenced by the production of climbing canes which attain an average mature height of 6 to 8 feet, and by the habit of bearing its flowers on stems which grow as laterals from the climbing canes.

3,910
ROSE

Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.

Filed Mar. 31, 1975, Ser. No. 563,293
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—26 1 Claim

1. A new and distinct variety of rose plant substantially as herein shown and described, characterized by the distinctive pink coloration of its flowers, its much branched, free, vigorous and upright growth habit, and by its continuous and abundant production of flowers borne on strong straight stems and having excellent keeping qualities as cut flowers.

3,911
BEGONIA PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed May 7, 1975, Ser. No. 575,440
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of begonia plant characterized particularly as to uniqueness by the combined characteristics of upright growth habit; rose red tepal color; superior keeping quality; double flower form; propagatable from leaf as well as stem cuttings, and by its apparent immunity to common powdery mildew and high resistance to *Xanthomonas begoniae*.

3,912
POINSETTIA PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed May 7, 1975, Ser. No. 575,435
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct cultivar of poinsettia plant characterized particularly as to novelty by the combined characteristics of development of flowers and red bracts at 52°–54° F.; heavy, rigid upright stems; small foliage and close internodes; four to eight vigorous shoots after removal of the apical tip; durable bracts; long lasting foliage; resistance to botrytis infection, and by its distinct, dark red leaf petiole.

3,913
BEGONIA PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed May 5, 1975, Ser. No. 574,626
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of begonia plant characterized particularly by the combined characteristics of red tepal color and unique "flower-in-flower" form which

gives added depth to individual flowers; propagatable by leaf cuttings that develop vegetative adventitious shoots, superior foliage quality, with the foliage being immune to powdery mildew, and by its vigorous and upright growth habit.

3,914

ROSE PLANT NAMED FESTIVE

Robert G. Jelly, Richmond, Ind., assignor to E. G. Hill Co., Inc., Richmond, Ind.

Filed July 7, 1975, Ser. No. 593,731

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—29 **1 Claim**

1. A new and distinct variety of rose plant substantially as herein shown and described, characterized by its continuous production of lustrous dark red blooms on strong, long, upright stems and strong erect peduncles of medium length, its vigorous and moderately free growth habit with almost complete elimination of blind wood, and its superior wintertime productivity.

3,915

NECTARINE TREE

Yoshio Yamada, Kingsburg, Calif., assignor to Vaughn Girazian, Fresno, Calif.

Filed July 14, 1975, Ser. No. 595,450

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree substantially as herein shown and described which bears large semi-cling yellow-fleshed and yellow-skinned fruit moderately streaked with red, similar to the Autumn Grand nectarine of U.S. Plant Pat. No. 2,894, in color but not as bright, particularly characterized as to novelty by ripening from September 25 to October 5, three or four weeks later than the Autumn Grand.

PATENTS

GRANTED JUNE 15, 1976

ERRATA

For CLASS	See PATENT NO.
014–069.5	3,962,747
057–034 HS	3,962,829
062–009	3,962,881
339–017 CF	3,963,315
339–017 C	3,963,316
339–074 R	3,963,317
339–097 P	3,963,318
339–176 MF	3,963,319
339–177 R	3,963,320
339–177 E	3,963,321
339–272 R	3,963,322
073–064.1	3,963,349
008–014	3,963,428
008–038	3,963,429
008–039	3,963,430
008–041 C	3,963,431
008–093	3,963,432
008–120	3,963,433
008–120	3,963,434
008–120	3,963,435
008–168 A	3,963,436
008–192	3,963,437
021–058	3,963,438
023–230 PC	3,963,439
023–253 R	3,963,440
023–253 R	3,963,441
023–253 TP	3,963,442
023–262	3,963,443
023–277 C	3,963,444
023–288 FC	3,963,445
023–288 A	3,963,446
023–288 FA	3,963,447
023–288 FB	3,963,448
029–182.5	3,963,449
029–191.4	3,963,450
029–196.1	3,963,451
029–193.5	3,963,452
029–197.5	3,963,453
029–197.5	3,963,454
029–198	3,963,455
029–203 B	3,963,456
048–202	3,963,457

ERRATA – Continued

For CLASS	See PATENT NO.
204–180 P	3,963,567
204–181	3,963,568
204–206	3,963,569
204–158 R	3,963,570
209–073	3,963,607
261–041 D	3,963,670
526–303	3,963,684
526–230	3,963,685
526–066	3,963,687
526–193	3,963,688
526–006	3,963,689
526–065	3,963,690
526–022	3,963,791
178–069.5 TV	3,963,877
235–144 R	3,963,903
315–381	3,963,961
320–021	3,963,976
331–094.5 Q	3,964,003
337–067	3,964,004
343–108 M	3,964,053
340–244 E	3,964,079
321–045 R	3,964,086
338–306	3,964,087
340–172.5	3,964,088

PATENTS

GRANTED JUNE 15, 1976

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,962,728

HEAD TURBAN

Claudia S. Pavlinik, North Arlington, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 7, 1975, Ser. No. 556,444

Int. Cl.² A42C *5/04*; A42B *1/02*

U.S. Cl. 2—174 **9 Claims**

1. A method of forming a head turban used for a person's head, which comprises:

a. forming a first elongated rectangular shaped member having a top and a bottom horizontal edge and a left and a right vertical end;

b. forming a second wider elongated rectangular shaped member having a top and a bottom horizontal edges and a left and a right vertical end, wherein said first member equals said second member in length;

c. sewing said top edge of said first member to said bottom edge of said second member;

d. folding in half said first and said second members as sewn together on a lateral center line;

e. sewing together a bottom half of said right and said left ends of said second member leaving unsewn a top half of said right and said left ends of said second member;

f. sewing together each side of said top edge of said second member from said center line to points midway between said center line and said left and said right ends of said second member leaving unsewn an outer portion of said top edge at said left and said right ends;

g. cutting away along smooth broad radii a top left and a top right corner of said second member;

h. securing first VELCRO tabs along each said outer portion of said top edge, each said cutaway corner, and each said unsewn top half of said left and said right ends of said second member; and

i. securing a second VELCRO tab along each said left and right ends of said first member.

3,962,729

ZIPPER FLY CONSTRUCTION FOR GARMENTS

Dudley W. Cook, Merriam, Kans., assignor to The H. D. Lee Company, Inc., Shawnee Mission, Kans.

Continuation of Ser. No. 342,473, March 19, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,746

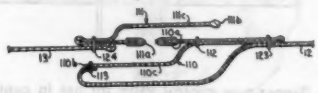
Int. Cl.² A41D *1/06*; A44B *19/34*

U.S. Cl. 2—234 **4 Claims**

1. In a zipper fly construction for garments having a right and left panel to be joined by the fly, one of said panels being overlapped by the other at the fly, the combination of

a first unitary piece of fabric secured to said one panel and forming a first web portion extending from said one panel, said first web portion having a free edge located beyond said one panel and zipper scoops secured along said free edge, said first piece of fabric also formed with a second web portion which is generally parallel with and overlies said first web portion, said second web portion overlying and terminating well past the zipper scoops,

a second unitary piece of fabric secured to said other panel, said second piece forming a first web portion extending from said other panel, said first web portion on said second piece having a free edge and zipper scoops along said free edge for joinder with the zipper scoops on the first piece of fabric to close the fly, said second piece of fabric also formed with a second web portion which is generally parallel with and overlies said first web portion of said second piece and extends well past the zipper scoops on said second piece,



said second piece connected to said other panel at spaced locations with the second web thereof secured to the portion of said other panel overlapping said first panel so that said overlapping portion of said other panel is on the opposite side of said second web portion, to which it is secured, from said zipper scoops,

said pieces and panels so located relative to one another that the zipper scoop edges can be joined to connect the panels, and when joined, the joined zipper scoops are covered on one side by the second web portion of the first piece and on the other side by the second web portion of the second piece and the interconnected overlapping portion of the other panel.

3,962,730

REMOVAL OF FAULTY MATERIAL IN THE MANUFACTURE OF NON-METALLIC WEBS

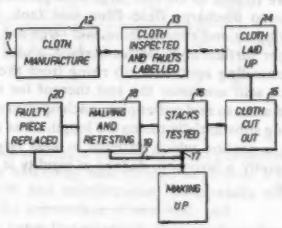
Eric Richard Robinson, Chalfont St. Giles, England, assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 15, 1975, Ser. No. 568,342

Claims priority, application United Kingdom, Apr. 17, 1974, 16767/74

Int. Cl.² B26D *5/00*

U.S. Cl. 2—243 B **7 Claims**



1. A process of manufacture which comprises providing a non-metallic web, inspecting said web visually for at least one occasionally occurring characteristic, when such characteristic is noticed marking its location by adhesively attaching a label incorporating a metal foil to said web adjacent the characteristic, dividing said web into pieces, and inspecting said pieces by a metal detector to locate said label.

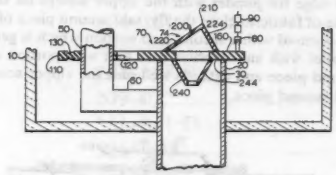
3,962,731
FLAPPER-TYPE DISCHARGE VALVE FOR FLUSH TANKS

Samuel S. Chelten, Highland Park, N.J., assignor to Marvin H. Chelten, Princeton, N.J.

Continuation-in-part of Ser. No. 457,659, April 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 349,808, April 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 201,727, Nov. 24, 1971, abandoned. This application July 10, 1975, Ser. No. 594,639

Int. Cl.² E03D *1/34*

U.S. Cl. 4—56 **24 Claims**



1. A flapper-type control valve for use in controlling the retention and discharge of fluid by streamline action from a tank through an outlet pipe therein, said valve comprising

a generally flat, flexible member having securing means at one end, by means of which it can be secured to a vertical pipe adjacent to said outlet pipe which comprises a pivot with respect to which the member rotates when operated to discharge fluid from said tank,

said member having a generally flat top surface and a bottom surface and including a large-area portion adapted to overlay and obstruct the outlet opening in said outlet pipe with the fluid in the tank exerting pressure on said top surface thereof, and

a projecting member extending upwardly from said top surface of said flat member and having a relatively sharp line-like leading edge for providing generally streamline flow through said water when said valve is raised and rotated to permit said fluid to flow through ssid outlet pipe.

21. A flapper-type control valve for use in controlling the retention and discharge of fluid from a tank through an outlet pipe therein, said valve comprising

a generally flexible, large-area portion adapted to overlay and obstruct the outlet opening in said outlet pipe, with the fluid in the tank exerting pressure thereon,

a pair of arms extending from said large-area portion, generally parallel to each other for coupling to a vertical pipe adjacent to said outlet pipe with respect to which the valve rotates to lift said large-area portion off said outlet pipe to discharge fluid from said tank, each said arm having an end remote from said large-are portion and an upper surface and a lower surface, and

an upstanding apertured rib rising from the top surface of each said arm near the end thereof for use in coupling said arms to said outlet pipe, each apertured rib extending along substantially the entire length of its arm and including a portion which extends to said large-area portion whereby a favorable degree of rigidity is imparted to its arm.

3,962,732
DISPOSABLE BEDPANS

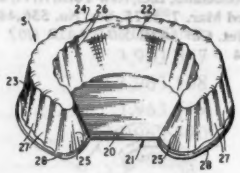
Kenneth Wilson Mills, 11 Redcar Road, Smithills Dean Bolton, Lancashire, England (BL1 2HP)

Filed May 9, 1975, Ser. No. 576,020

Int. Cl.² A61G *9/00*

U.S. Cl. 4—112 **5 Claims**

1. In combination, an assembly comprising a bedpan of a disposable fibrous pulp material having a seat portion provided with a downturned peripheral lip, a receptacle portion provided within said seat portion and having downwardly convergent side walls, said receptacle portion being elongated from the front to the rear and being bilobate in plan view with the rear part of greater radius than the forepart, and a support of a disposable fibrous pulp material being fitted around the rear part of said bedpan, said support being a one-piece unit comprising a planar base generally circular in shape with a



front chordal edge, a divergent wall extending upwardly from the curved periphery of said base and connected to a downwardly divergent skirt by an upper generally horizontal web, and said wall and skirt being connected at the front by conic wall sections, and said support being arranged fitting snugly around the rear part of the bilobate receptacle portion of said bedpan with said front conic wall sections of said support being located in the waisted sides of said receptacle portion.

3,962,733
ALL WEATHER SAFETY SHOWER

Edward Parry, New York, N.Y., assignor to Thermal Conduction Engineering Corporation, Secaucus, N.J.

Filed Aug. 30, 1973, Ser. No. 392,992

Int. Cl.² E03C *1/02*

U.S. Cl. 4—145 **10 Claims**

1. A safety shower comprising a piping system including a vertical portion leading from a constant water supply to an elevated horizontal portion terminating in a downwardly directed shower head, a quick actuating valve closely adjacent said shower head, control means for said valve readily accessible to an individual beneath said shower, an ambient temperature sensitive bleed valve assembly closely adjacent and in advance of said quick actuating valve, said bleed valve assembly further having a bleed valve containing valve actuating means which respond to said sensor to open and close said bleed valve at predetermined ambient temperatures, said temperature sensitive bleed valve being set to open as ambient

temperature reaches and exceeds predetermined depressed or elevated levels, thereby providing a limited flow of water through the piping system in advance of said quick actuating valve while the shower is not in use, upon and during occurrence of said predetermined depressed or elevated ambient temperature levels.

3,962,734

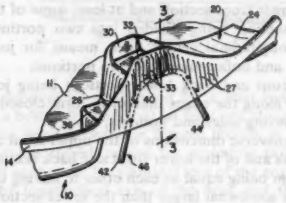
THERMOFORMED WADING POOL WITH INTEGRAL SLIDE AND HANDRAIL

Ascher Chase, Virginia Beach, Va., assignor to General Foam Plastics Corporation, Norfolk, Va.

Continuation-in-part of Ser. No. 396,680, Sept. 13, 1973, Pat. No. 3,908,205. This application Sept. 3, 1974, Ser. No. 502,364

Int. Cl.² E04H *3/16, 3/18*

U.S. Cl. 4—172 **5 Claims**



1. In a container structure comprised of a single thermoformed sheet of plastic material having a flat bottom wall of predetermined configuration and circumscribing peripheral side walls of a predetermined height extending upwardly therefrom; a flange at the upper edge of said side walls; and an integral sliding surface sloping upwardly from said bottom wall along said peripheral side walls to a mounting platform therefor; the improvement comprising

a. a side wall for said slide structure and said mounting platform extending from said flat bottom wall to said mounting platform, said side wall being rigidified by heavy vertical ribs;

b. a hollow handrail on each side of said mounting platform, one of said handrails including portions integral with said slide wall and forming an upwardly extending extension thereof; and

c. the other of said handrails including portions integral with said flange adjacent said platform and forming an upwardly extending extension thereof, said upwardly extending flange portion including an enlarged skirt portion adjacent said platform;

d. said inner surfaces of said skirt portion accommodating the insertion therein and attachment thereto of a support leg means.

3,962,735

MOVABLE BULKHEAD WITH GUIDING AND OVERCANTING PREVENTION MEANS

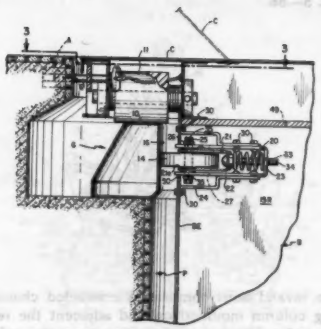
Dekkers H. Davidson, 420 Nanyhagen Road, Thornwood, N.Y. 10594

Filed Dec. 28, 1973, Ser. No. 429,093

Int. Cl.² E04H *3/16, 3/18*

U.S. Cl. 4—172.12 **16 Claims**

1. A moveable bulkhead, for use in a swimming pool having rail means along the upper periphery of the sides thereof, for extending across and dividing the pool into separate activity areas, said bulkhead having forward and rearward walls and means for mounting the same in spaced relation means positioned intermediate the ends of said forward and rearward walls for supporting said bulkhead upon the upper surface of the rail means while stationary thereon and while being moved therealong, the improvement comprising means separate and remote from said supporting means for guiding and preventing over-canting of said bulkhead as it is moved, for preventing the ends of said forward and rearward walls from contacting



the sides of the pool, said guiding and preventing means including means for mounting the same adjacent the ends of said forward and rearward walls, said guiding and preventing means extending from said mounting means for substantially constant contact against the sides of the pool.

3,962,736

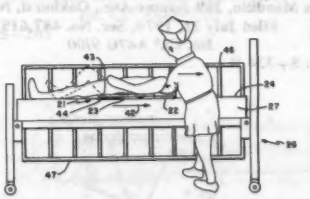
DEVICE FOR MOVING OR POSITIONING A PATIENT IN A BED

Margaret T. Fedele, 828 Carmel Court, San Leandro, Calif. 94578

Filed June 25, 1975, Ser. No. 590,205

Int. Cl.² A61G *1/02*

U.S. Cl. 5—81 R **7 Claims**



1. A device for moving a patient in a bed comprising:

a horizontally extending base formed to provide a substantially smooth and uninterrupted horizontally extending path over the top surface of said bed; and

a horizontally extending relatively rigid platform formed for support of a portion of said patient thereon and mounted in superimposed relation to a portion of said base, said platform and said base being cooperatively formed for low friction guided simultaneous reciprocation of all portions of said platform to and fro over said base along said horizontally extending path to enable movement of said patient by a single attendant unimpeded by bed linens or the like.

3,962,737

LIFTING MEANS

David Richard James, Hasfield, England, assignor to Mecanaids, Limited, United Kingdom

Continuation of Ser. No. 256,581, May 24, 1972, abandoned.
This application July 19, 1974, Ser. No. 490,125
Claims priority, application United Kingdom, May 28, 1971, 18035/71
Int. Cl.[2] A47B *83/04*
U.S. Cl. 5—86 8 Claims

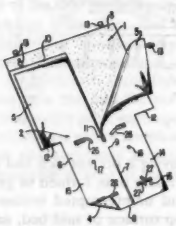
1. An invalid hoist comprising a wheeled chassis, an upstanding column mounted on and adjacent the rear of the chassis, and a lifting arm projecting from the column, said chassis having a cross-member, two arms secured to and extending forwardly from said cross-member in spaced relation to leave a front opening between them and being provided adjacent their forward ends with fixed-axis load-carrying front wheels, two laterally spaced fixed-axis load-carrying wheels rotatably conected proximate the ends of said cross-member and being secured to said cross-member and extending rearwardly therefrom to define a T-shaped rear portion of said chassis, disposed intermediate the front wheels and the column, a rear member and a castor support wheel mounted on said rear member adjacent the rear of the chassis, the arrangement being such that the chassis with a patient supported thereon normally rests on the front and intermediate wheels with the rear wheel free of the ground but, for purposes of maneuvering, the hoist can be tilted back about the intermediate wheels onto the rear castor wheel.

3,962,738

STROLLER BLANKET

Barbara Menditto, 289 Jerome Ave., Oakhurst, N.J. 07755

Filed July 11, 1974, Ser. No. 487,619
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—334 R 10 Claims



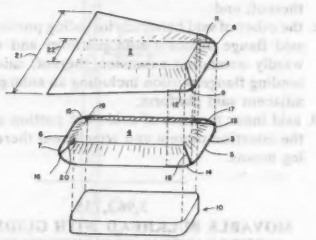
1. A child or infant covering comprising:
   1. a back section having:
   a. an upper generally rectangular portion with its transverse dimension somewhat larger than its longitudinal dimension;
   b. a lower generally rectangular portion joined to the upper rectangular portion at a common transverse boundary and having a bottom edge;
   c. said lower rectangular portion having a transverse dimension no more than that of the upper rectangular portion, and having a longitudinal dimension at least equal to said transverse dimension;
   d. said lower rectangular portion having a longitudinal slit at its longitudinal center line extending from the bottom edge to a crotch at a distance more than half but less than the entire longitudinal dimension of said lower rectangular portion, whereby a bifurcated lower back portion is formed;
   2. a front section having a top edge comprising:
   a. an upper generally rectangular portion somewhat smaller longitudinally than the upper rectangular back portion and having the same transverse dimension as the latter;
   b. a bifurcated lower front portion having the same shape and dimensions as the bifurcated lower back portion and joined to the upper front portion along a common transverse boundary;
   c. said upper front section and at least some of the lower front section being divided into two portions along their longitudinal center lines, means for joining together and unfastening said two portions;
   3. said front and back lower portions being joined together along the edges thereof to form closed leg portions having sides and bottoms;
   4. the transverse dimensions of the upper front and back sections and of the lower front and back sections ranging from being equal to each other to having the upper section somewhat larger than the lower section, and in the case of the latter having segments of the upper sections projecting beyond the ends of the lower section;
   5. any segments of the front and back upper portions projecting beyond the front and back lower portions being joined together at the lower edges of said projecting portions; and
   6. means to fasten the upper edges of the front and back upper portions at the corners thereof.

3,962,739

BEDSHEETING ARRANGEMENT

Lou Anne Crockett, P.O. Box 51, Brusly, La. 70719

Filed Jan. 16, 1975, Ser. No. 541,581
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—334 C 5 Claims



1. A one-piece bedsheeting arrangement that fits about a mattress, which comprises:
   a. a top sheet having rounded corners at one top sheet end and with top darts extending inward from each of said rounded corners to a point of said top sheet that will lay adjacent a corner of said mattress nearest said dart;
   b. a bottom sheet having rounded corners at both bottom sheet ends, wherein said rounded corner at one end of said bottom sheet ends have an identical curvature as said rounded top sheet corners, and have bottom darts extending inward from each of said rounded corners to a point of said bottom sheet that will lay on a corner of said

mattress nearest each of said darts, and connected to said top sheet by an elastic strip sewn to both sheets at said ends having said identical curvature, which elastic strip extends along said sheets' perimeter from one of said rounded corners to another of said rounded corners, and

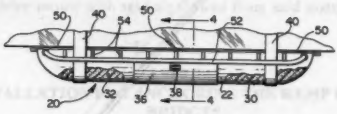
c. a second elastic strip sewn to the other end of said bottom sheet along said other end's rounded corners.

3,962,740

SURVIVAL KIT ATTACHMENT FOR A BOAT

John W. White, 9 Fairhaven Road, Mattapoisett, Mass. 02739

Filed Mar. 24, 1975, Ser. No. 561,269
Int. Cl.² B63C 9/00
U.S. Cl. 9—14 **7 Claims**



1. A survival kit attachment for a boat having a hull that defines a botton for said boat, at least one elongated container having an interior chamber formed therein in which survival equipment is stored, means for mounting said container on said hull so that the longitudinal axis of the container is parallel to the longitudinal axis of the boat and the container is disposed on the bottom of the boat exteriorly thereof for complete immersion in water during normal operation of said boat, said container including a generally flat bottom wall located adjacent to said hull in generally parallel relation thereto and further including a generally curved outer wall that extends outwardly of said hull but that offers minimal resistance to the water during movement of the boat therethrough, flotation material located in end portions of said container for assisting in promoting a pontoon effect thereof and insuring that the boat remains afloat upon the capsizing thereof, a chamber formed in said container intermediate the floatation material for receiving said survival equipment therein, an opening formed in said curved wall and communicating with said chamber and equipment stored therein, and a door mounted on said curved wall for sealing said opening when said container is immersed in water as mounted on said hull, said door being movable to an open position to provide access to said chamber and the survival equipment therein when said boat is overturned in water.

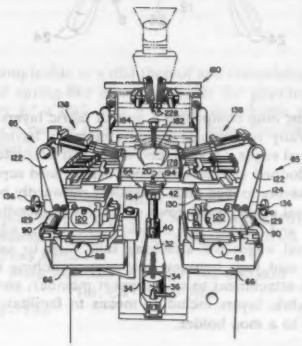
3,962,741

HEEL AND SIDE LASTING MACHINE

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Mar. 27, 1975, Ser. No. 562,746
Int. Cl.² A43D 21/00
U.S. Cl. 12—10.5 **2 Claims**

1. A lasting machine comprising: heel wiping means, symmetrically disposed about a forwardly-rearwardly extending line of symmetry, mounted for forward movement from a retracted position to an advanced position in a heel wiping stroke; support means for so supporting bottom-up a shoe assembly, formed of a last having an upper mounted thereon and an insole located on its bottom, that the heel portion of the shoe assembly faces the heel wiping means and is located forwardly of the heel wiping means when the heel wiping means is in its retracted position whereby the heel wiping stroke causes the heel wiping means to wipe the heel portion of the upper margin against the insole, said support means being so movably mounted as to enable the heel portion of the shoe assembly to be swung transversely of said line of symmetry to thereby place the heel portion of a particular shoe assembly in symmetry with said line of symmetry; a base located outwardly of and on each side of the support means; means mounting each base for pivotal movement about an upright axis towards and away from said line of symmetry; a side lasting instrumentality mounted to each base for inward-outward movement and extending forwardly of its associated axis, each side lasting instrumentality being so constructed as to enable it, when it is moved inwardly of an outer position on its associated base, to perform operations on its associated side portion of the shoe assembly that include engaging its



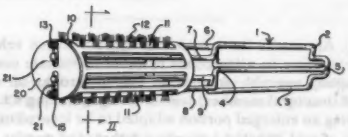
associated side portion of the shoe assembly and wiping the margin of its associated side portion of the upper against the insole; and moving means for swinging each base about its associated axis between a first position wherein its associated side lasting instrumentality extends forwardly and outwardly of its associated axis and a second position wherein its associated side lasting instrumentality so extends forwardly of its associated axis that it is located inwardly of said first position.

3,962,742

HAIR STYLING BRUSH

John Vendur, 1228 Scalp Ave., Johnstown, Pa. 15904

Filed June 13, 1975, Ser. No. 586,581
Int. Cl.² A46B 7/02
U.S. Cl. 15—201 **8 Claims**



1. A hair styling brush comprising:

a. a handle comprised of two members each of said members having first and second prongs,

b. brush housing means fixably attached to said first prong means of each of said handle members,

c. bristle housing means fixably attached to the second prong means of each of said handle member, said bristle housing means extending inwardly of said brush housing member; and

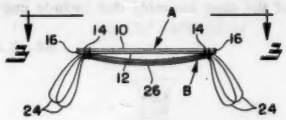
d. bristles extending from said bristle housing means extending outwardly of said brush housing means through apertures in said brush housing means.

3,962,743

MOP AND METHOD OF MAKING SAME

Theron V. Moss, P.O. Box 234, Cleveland, Tenn. 37311

Filed June 27, 1974, Ser. No. 483,536
Int. Cl.² A47L 13/20
U.S. Cl. 15—229 AP 15 Claims



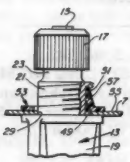
1. A dust mop comprising a pair of fabric layers defining a flat generally rectangular support member having opposite longitudinal edges, opposite end edges and a longitudinal axis, a row of looped yarn adjacent one side of said support member and having looped ends extending outwardly beyond said longitudinal edges, outer rows of stitching extending through said yarn and at least one of said fabric layers adjacent said longitudinal edges for attaching said yarn to said support member, said yarn between said outer stitching rows being free from attachment to said support member, and the other of said fabric layers including means to facilitate mounting said mop to a mop holder.

3,962,744

LOCKING AND SEALING WASHER APPARATUS

Alfred A. Bien, West Bloomfield, and Robert W. Glover, Detroit, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 13, 1974, Ser. No. 523,305
Int. Cl.² B60S 1/34
U.S. Cl. 15—250.34 3 Claims



1. Apparatus for connecting an automotive vehicle windshield wiper to a structural member of vehicle comprising a coupling assembly adapted to extend through an opening in said structural member, said coupling including a tubular unit having an enlarged portion adapted to be located on the lower side of said structural member, a threaded portion extending from said enlarged portion and adapted to extend through said opening, a rotatable member extending through said tubular unit and adapted to be connected at its upper end to said wiper and at its lower end to an actuating assembly, said threaded portion having a slot therein, a deformable washer having a ring portion surrounding said threaded portion and a tapered finger extending from said ring portion and being located in said slot, a nut threaded on said threaded portion, said finger having a portion thereof deformable by said nut as the latter is moved toward said enlarged portion, said deformable portion inhibiting the removal of said nut when the latter is threaded onto said threaded portion, a portion of said threaded portion closing the upper end of said slot and forming a stop against which the upper end of said finger abuts.

3,962,745

WALL RUG CLEANING MACHINE

Sydney Wellington Collier, R.R. No. 2, Norval, Ontario, Canada

Filed Nov. 21, 1974, Ser. No. 525,773
Int. Cl.² A47L 7/00
U.S. Cl. 15—322 3 Claims

1. A cleaning device for wall rugs and the like comprising a head, a rigid tube, and means for connecting said head to said rigid tube which is adapted to permit relative movement of said head about an axis of said rigid tube; said head including means for applying cleaning fluid to a rug surface throughout a first area, means for applying a vacuum to a rug surface throughout a second area which substantially completely surrounds said first area, an inner wall which has a free end defining an enclosure for said means for applying cleaning fluid where said first area is defined by and within said free end of the inner wall, and an outer wall which has a free end and which surrounds said inner wall to define an annular chamber between said inner wall and said outer wall, said annular chamber having an open end where said second area is defined between the free ends of said inner and outer walls, said annular chamber being in communication with a source of vacuum, the free ends of said inner and outer walls lying substantially in the same plane where said head is free of any projections extending substantially beyond said plane in a direction away from said head so that the free ends of said inner and outer walls are adapted to contact a rug surface to be cleaned.

3,962,746

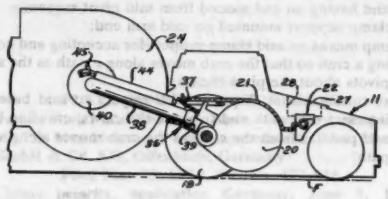
SELF-PROPELLED VACUUM CLEANER

Milton J. Johnson, Danville, Ky., and Joseph F. Schmitz, St. Paul, Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 6, 1974, Ser. No. 530,071
Int. Cl.² A47L 9/22
U.S. Cl. 15—340 14 Claims

1. In a self-propelled vacuum cleaner structure having a nozzle provided with a lower suction inlet and an upper wall portion, air flow suction means carried by the nozzle for flowing dirt laden air through the nozzle suction inlet and a dirt collector, and propelling means carried by the nozzle including vertically adjustably mounted wheels movably supporting the nozzle on a surface to be cleaned and means for driving the wheels including an electric drive motor movably mounted to said nozzle, the improvement comprising duct means for connecting relatively clean air from externally of the nozzle through said upper wall portion of the nozzle to said drive

motor for cooling the same and from said drive motor to said air suction means for delivering the relatively clean air from



said drive motor with said air flowed from said nozzle suction inlet.

3,962,747

INSTALLATION FOR ANCHORING THE RAMP ENDS OF BRIDGES

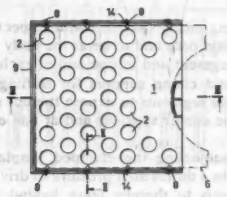
Friedhelm Soffge, Kornwestheim, Germany, assignor to Dr. - Ing. H.c.F. Porsche Aktiengesellschaft, Germany

Filed Jan. 27, 1975, Ser. No. 544,270

Claims priority, application Germany, Jan. 25, 1974, 2403495

Int. Cl.² E01D *15/12*

U.S. Cl. 14—69.5 **26 Claims**



1. An arrangement for securing a ramp end of a bridge to a ramp end support surface, the arrangement comprising: anchoring plate means associated with the ramp end, gripping means provided on said anchoring plate means for firmly gripping the ramp end support surface to anchor the ramp end to the support surface, and tension means for releasably securing the anchor plate means to the ramp end, the anchoring plate means includes an upper surface portion facing the ramp end and a lower surface portion facing the ramp end support surface, said gripping means including a plurality of openings provided in said anchoring plate means having rim portions projecting from the lower surface of said anchoring plate means to form claw-like edges which engage the ramp end support surface.

3,962,748

TV CONTROL DEVICE

Chris T. Michaels, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 24, 1975, Ser. No. 561,101

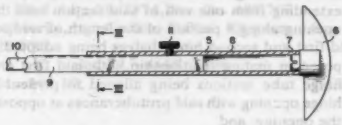
Int. Cl.² E05B *1/00*

U.S. Cl. 16—114 R **2 Claims**

1. A TV control device for rotating a dial of a TV set, from an area distant from the set, said TV control device comprising

a rod-like member of variable adjustable length having a handle at one end, said rod-like member being independent from a TV set and comprising a plurality of telescoped sections and fastening means for releasably affixing the sections in position relative to each other, each of the sections of the rod-like member being of substantially hollow rectangular configuration;

a head part detachably secured at the opposite end of the rod-like member for cooperating with the dial of a TV set in a manner whereby a user in an area distant from the set selectively rotates the dial via the rod-like member, said head part being independent from a TV set but remov-



ably coupleable to a dial thereof and comprising a pair of spaced spring-like clamping heads for gripping the periphery of a dial, and a second detachable head post having a pair of opposed radially extending flat ears for cooperating with the slots of a dial.

3,962,749

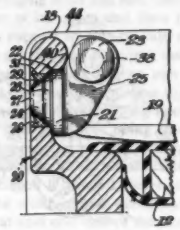
HINGE BUTT AND MOUNTING ASSEMBLY

Andrew Abolins, Langhorne, Pa., assignor to Strick Corporation, Fairless Hills, Pa.

Filed May 22, 1975, Ser. No. 580,026

Int. Cl.² E05D *5/06*

U.S. Cl. 16—135 **10 Claims**



1. A mounted hinge butt for connection to an exposed elongated member having an inside and outside comprising an elongated base having a front and a back, a slot in the member, an elongated tapered plug on the back of the base loosely engaged within the slot with the base on the inside of the member and a weldment between the plug and the inner wall of the slot accessible from the outside of the member whereby the butt is secured to the member.

3,962,750

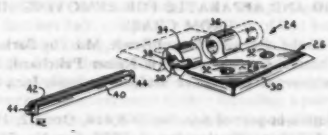
HINGE CONSTRUCTION

Kenton A. Buss, Oxford, and Tony E. Branscum, Winfield, both of Kans., assignors to Gott Manufacturing Co., Inc., Winfield, Kans.

Filed Apr. 7, 1975, Ser. No. 565,408

Int. Cl.² E05D *5/10*

U.S. Cl. 16—168 **8 Claims**



1. Hinge construction comprising:

a first hinge half presenting a generally planar mounting portion and an integral first hinge tube section,

said first hinge tube section presenting a protuberance extending from one end of said section into the tubular opening along a portion of the length of said section;

a second hinge half presenting a generally planar mounting portion and an integral second hinge tube section,

said second hinge tube section presenting a protuberance extending from one end of said section into the tubular opening along a portion of the length of said section;

said first and second hinge halves being adapted to be disposed in mating relationship with said first and second hinge tube sections being aligned to present a tubular hinge opening with said protuberances at opposite ends of the opening; and

a hinge pin having a longitudinally extending slot disposed therein generally complemental in configuration to the shape of said protuberances whereby said pin may be inserted within said tubular hinge opening when said slot is aligned with the protuberance at one end of said opening and held therein upon rotation to a nonaligning position to cooperate with said first and second hinge halves to present a hinge.

3,962,751

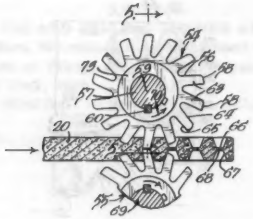
SCORING APPARATUS

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Filed Feb. 7, 1975, Ser. No. 547,863

Int. Cl.² A22C 9/00

U.S. Cl. 17—26 **8 Claims**



1. Apparatus for scoring a patty of ground raw meat, comprising: conveyor means for moving the patty in a path through a scoring station; a scoring device at said scoring station comprising a plurality of generally circular blades arranged side-by-side along an axis of rotation that extends generally transversely to said path, each blade comprising a plurality of spaced outwardly projecting teeth of a flexible plastic polymer capable of sideways deflection without material damage to the teeth upon striking an obstruction, said teeth having blunt outer ends substantially describing a circle; and means for rotating said scoring device for scoring the surface of a patty carried by said conveyor means through said scoring station, each said blade having its said teeth spaced from and angularly staggered with respect to the teeth in the next adjacent blade.

3,962,752

METHOD AND APPARATUS FOR REMOVING MEAT FROM CRABS

Melvin B. Cooke, deceased, late of Bowie, Md. (by Barbara M. Cooke, administrator), and Eric Kaiser Pritchard, Bowie, Md., assignors to Innovative Seafood Systems, Inc., Bowie, Md.

Continuation-in-part of Ser. No. 868,414, Oct. 22, 1969, abandoned. This application Jan. 3, 1975, Ser. No. 538,329

Int. Cl.² A22C 29/00

U.S. Cl. 17—71 **6 Claims**

1. Apparatus for removing the meat from a crab body, comprising:

a base;

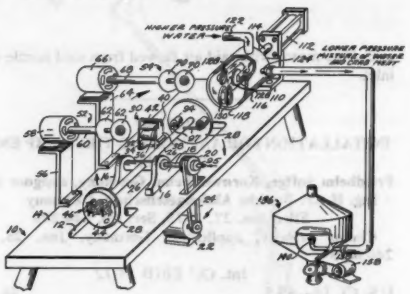
pivot means on said base;

an arm pivoted by said pivot means for rotation on said base and having an end spaced from said pivot means;

a clamp support mounted on said arm end;

clamp means on said clamp support for accepting and holding a crab so that the crab moves along a path as the arm pivots about the pivot means;

first cutting means disposed with respect to said base to intersect said path and to sever the claws, crawling legs and paddles from the crab as the crab moves along said path;



second cutting means disposed with respect to said base to intersect said path and to sever the body of the crab into a center segment and at one end of each end segment;

means on said clamp support for shifting said clamp to displace the segments to expose the cut surfaces at both ends of the center segment and at one end of each end segment;

means for subjecting the clamped, displaced crab body segments to a differential pressure to drive the meat from the segments to thereby leave behind the undesirable parts of the crab body.

3,962,753

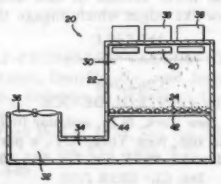
METHOD OF MAKING GLASS FIBER MATS AND CONTROLLING PRESSURE DROP ACROSS WEB BY VARYING PERFORATED PLATE BENEATH WEB

John W. Dunn, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 6, 1974, Ser. No. 467,543

Int. Cl.² D04H 1/00

U.S. Cl. 19—156.3 **3 Claims**



1. A method of making a continuous mat of glass fibers in an enclosed hood, comprising the steps of:

a. directing the fibers downwardly within the hood toward a continuously moving foraminous conveyor,

b. creating a predetermined pressure drop across the hood, below said conveyor, by locating a plate having a plurality of apertures below said conveyor, wherein the apertures in said plate define less than fifty percent of the total area of said plate, and

c. continuously collecting the glass fibers on said conveyor, said pressure drop providing a relatively uniform distribution of fibers on said continuously moving foraminous conveyor.

3,962,754

PLATE CONNECTORS FOR BELTS

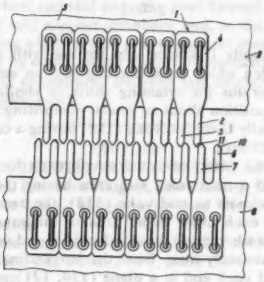
Hermann Stolz, Muhlheim am Main, Germany, assignor to MATO Maschinen-und Metallwarenfabrik Curt Matthaei GmbH & Co. KG, Offenbach, Germany

Filed May 23, 1974, Ser. No. 472,516

Claims priority, application Germany, June 1, 1973, 2327979

Int. Cl.² F16G 3/02

U.S. Cl. 24—33 B 3 Claims



1. In a connector for interconnecting the two opposite ends of a belt, wherein the connector has a plurality of connector members, each connector member having a pair of connector legs adapted to be secured to one of said two opposite ends of said belt and a U-shaped eye joining the two connector legs, said U-shaped eye being dimensioned to extend beyond the end of the belt, whereby the two ends of the belt may be joined by a connector rod extending transversely of the belt through the eyes of a plurality of said connector members secured to each of the two ends of the belt; the improvement wherein the cross-section through each eye in the region thereof through which the connector rod is adapted to extend, has an inwardly facing base surface which is straight in the plane of said cross-section, said base surface being curved in a plane extending at a right angle to said sectional plane and longitudinally to said belt, said inwardly facing base surface extending straight over the width of the eye to provide a wide surface contact between said base surface and a connector rod, each eye further having an outwardly facing surface opposite said base surface, which outwardly facing surface is so curved in said sectional plane and in said plane extending perpendicularly to said sectional plane, that the outwardly facing curved surface merges smoothly into the sides of its eye to allow opposite eyes to be readily guided into intermeshing by applying opposite longitudinal forces to the ends of the belt, and means for securing said connector legs to the respective belt end to form troughs between adjacent eyes to allow said intermeshing of said eyes, even when the opposed eyes and the opposite troughs between said eyes are slightly misaligned.

3,962,755

LINK COMPONENT FOR TRAWLING GEAR

Anthony Alan Buschini, Fleetwood, and Douglas Edward Swarsbrick, Stourport-on-Severn, both of England, assignors to Parsons Controls Limited, Stourport on Severn, England

Filed Aug. 19, 1974, Ser. No. 498,767

Claims priority, application United Kingdom, Aug. 24, 1973, 40208/70

Int. Cl.² A44B 13/00

U.S. Cl. 24—201 HL 7 Claims

1. A unitary link component for use with a fishing trawl and having an intermediate generally transverse portion separating a first end of the component from a second end thereof; a pair of diverging arms extending outwardly from said intermediate portion toward said first end; a crown connecting together the outer ends of said arms at one end of said link component to define, with said diverging arms and said intermediate portion, a closed loop wider at its outer end than its inner end and sufficiently wide to receive in side-by-side relation a pair of couplers to provide a Y-shaped coupling, said arms extending a major portion of said closed loop; a pair of parallel arms extending from said intermediate portion toward said second end of said component; means defining apertures in each of said parallel arms, said apertures being transversely aligned with respect to said parallel arms; and a connecting pin in said apertures and providing with said parallel arms and said intermediate portion a closed U-shaped clevis adapted to receive a link of a chain, the width of said clevis being less than that of said closed loop at said one end of the component, at least one of said diverging arms having a portion of a predetermined reduced thickness to accommodate the throat of a hook of predetermined size when the hook and said component are relatively oriented with said throat positioned to pass over said one of said diverging arms at its portion of reduced thickness, thereby to engage said hook operatively with said closed loop.

3,962,756

CONTINUOUS COUPLING ELEMENT FOR SLIDE FASTENERS

Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Aug. 16, 1974, Ser. No. 498,103

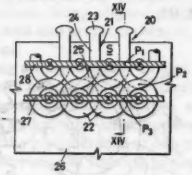
Claims priority, application Japan, Sept. 21, 1973, 48-111094[U]

Int. Cl.² A44B 19/12

U.S. Cl. 24—205.16 C 5 Claims

1. A continuous coupling element formed of a continuous elongated filament for attachment to a stringer tape to provide a slide fastener half, comprising a plurality of first loops having a series of uniformly spaced apart coupling heads along one longitudinal side thereof for mating engagement with identical coupling heads of a complementary continuous coupling element, each of said first loops further including a pair of shanks which are interconnected by each of said coupling heads and which are compressed into contact with each other at their ends remote from the coupling head, said pair of shanks being arranged in substantially parallel spaced relationship in a plane perpendicular to the plane of the stringer tape, and a plurality of second loops formed along the other longitudinal

side of said first loops and arranged in overlapping relationship in contact with each other, each of said second loops being formed by substantially annularly arranged extensions from said shanks of said first loops which extensions include crossed portions contacting each other, whereby said first and



second loops are arranged in contacting relationship at three dissimilar points, corresponding first loops and second loops being integrally connected to one another with said second loops being disposed substantially parallel to the stringer tape to come into intimate contact therewith and oriented transversely to said plane of the shanks in the first loops.

3,962,757

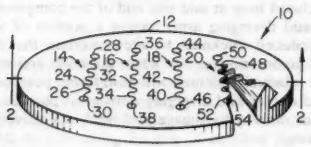
FABRIC FASTENER

John F. Gedney, P.O. Box 960, Boston, Mass. 02103

Filed Mar. 17, 1975, Ser. No. 559,124

Int. Cl.² A44B 21/00; B65D 77/10

U.S. Cl. 24—255 BS **10 Claims**



1. A device for holding a plurality of sheets of fabric-like material in a contoured configuration, said device comprising a resilient body formed with at least first, second, third and fourth grips, said first grip constituting a first corrugated slit that is bounded by a pair of holes at its ends, said second grip constituting a second corrugated slit that is bounded by a pair of holes at its ends, said third grip constituting a third corrugated slit that is bounded by a pair of holes at its ends, said fourth grip constituting a fourth corrugated slit that is bounded by a pair of holes at its ends, a longitudinal axis of any one slit being in spaced parallel relationship with a longitudinal axis of any other slit, at least one of said slits being longer in length than at least one other of said slits each of said slits configured to receive and captively hold a sheet of fabric-like material in a contoured configuration that constitutes a fitted corner, said slits arranged in such a manner that a sheet of fabric-like material inserted into one of said slits is operative to close said slits adjacent said one slit, said body in a bowed configuration when said sheets are received in said slits.

3,962,758

CLIP FOR RETAINING A SHIRT OR SIMILAR ARTICLE OF CLOTHING IN FOLDED POSITION ON AN INSERT

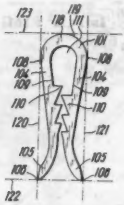
Heinrich Knappe, Eidinghausen; Karl Heinz Nolte, Vlotho, and Reinhold Kempelmann, Bad Salzuflen, all of Germany, assignors to Herbert Kannegiesser Kommanditgesellschaft, Vlotho, Germany

Filed Nov. 5, 1974, Ser. No. 521,017

Claims priority, application Germany, Nov. 10, 1973, 2356262

Int. Cl.² A44B 21/00

U.S. Cl. 24—255 GP **2 Claims**



1. A generally U-shaped clip for use with an automatic feeding device which feeds the clip into an automatic shirt folding apparatus for retaining shirts or similar articles of clothing in position about an insert, comprising:

a. a generally U-shaped yoke (**118**) having a constant width and thickness;

b. two arms (**104**) of equal length each having one end attached to said yoke, said arms having the same width and thickness as said yoke (**118**), the arms converging toward each other to an area of minimum separation distance whereupon the distal ends of said arms (**106**) are bent outwardly away from the longitudinal axis of said clip and each end in a plane (**120, 121**) parallel to the longitudinal axis of the clip and containing the outermost portion of said yoke (**118**); and

c. denticulations (**110**) located on the inner surface (**109**) of each of said arms at the area of minimum separation (**104**) to grip the shirt or similar article of clothing therebetween, the denticulations having a saw-toothed formation wherein the tips of same are directed towards the yoke (**118**) of the clip (**101**).

3,962,759

BAND CLAMPING DEVICE

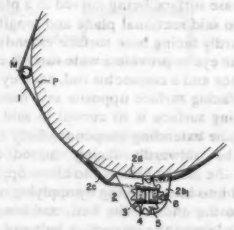
Hiroshi Nagai, Tokyo, Japan, assignor to Kabushiki Kaisha Suda Seisakusho, Tokyo, Japan

Filed Mar. 20, 1975, Ser. No. 560,112

Claims priority, application Japan, May 13, 1974, 49-54252

Int. Cl.² B65D 63/00

U.S. Cl. 24—269 **4 Claims**



1. A band clamping device, which comprises in combination:

a. a U-shaped main body having a bottom part thereof to constitute a seating member, and side parts extending from said seating member in the form of a channel to constitute a pair of support members;

b. a flexible band or strap, one end of which is folded so as to be hooked at one part of said seating member through at least one slot formed therein;

c. a T-shaped band take-up member having a parallelopiped head part and a pair of arcuate shaft members connected at one end thereof in said head part with their concaved faces being opposed each other providing a small gap therebetween so as to be utilized as a band insertion slot, the band take-up member being rotatably held in said pair of support members;

d. a ratchet wheel engaged with said gap between said opposing pair of the arcuate shaft members in a manner to rotate integrally with said band take-up members; and

e. a return preventive means including an engaging pawl provided on one part of said support member and which causes the engaging pawl to be engaged with said ratchet wheel,

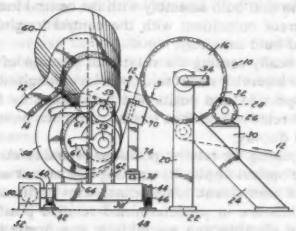
the angle of bending of said support members with respect to said seating member being made greater than 90° to thereby relax the overriding resistance between said ratchet wheel and said engaging pawl formed on one part of one of said support members, and, at the same time, the opening width of said pair of support members being narrowed by compression against its elasticity to thereby release the engagement between said ratchet wheel and said engaging pawl.

3,962,760

LAMINATING INTERLAYER EXPANDING APPARATUS

George A. Koss, Dearborn Heights, and Daniel J. Gurta, Westland, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 21, 1974, Ser. No. 516,846
Int. Cl.² B29C *24/00*; B29F *5/00*
U.S. Cl. 26—72 **3 Claims**



1. An apparatus for expanding a laminating interlayer which comprises:

feeding means for feeding a continuous web of laminating interlayer material from a supply thereof;

heating means for heating said web to a temperature whereat it is pliable;

cooling cone means including a motor driving the same both for applying a stretching force to and for cooling said web;

structure means for mounting said cooling cone means adjacent said feeding means and said heating means;

first measuring device means for measuring the thickness of said web between said heating means and said cooling cone means for developing a signal indicative of the measured thickness;

second measuring device means for measuring the width of said web between said heating means and said cooling cone means and for developing a signal indicative of the measured width;

controllable power source means for variably controlling the speed of said motor driving said cooling cone means in accordance with a control signal applied thereto;

control circuit means responsive to said signals indicative of thickness and width of said web for developing a control signal for application to said controllable power source means, said control circuit means (1) increasing said control signal when said signal indicative of thickness is above a predetermined thickness level and said signal indicative of width is above a predetermined width level, (2) not increasing said control signal even though said signal indicative of thickness is above a predetermined thickness level when said signal indicative of width is at or below said predetermined width level, (3) maintaining said control signal when said signal indicative of thickness is at said predetermined thickness level and said signal indicative of width is at or above said predetermined width level, and (4) reducing said control signal when said signal indicative of width is below said predetermined width level; and

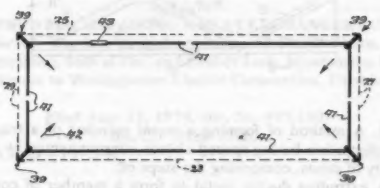
circuit means for connecting said first and said second measuring means to said control circuit means whereby changes in the thickness and the width are used to control the rotational speed of said motor of said cooling cone means.

3,962,761

CASKET HAVING IMPROVED CORNER BRACKETS

Robert L. Boughner, 3898 Schintzius Road, Eden, N.Y. 14057

Filed Oct. 11, 1974, Ser. No. 514,013
Int. Cl.² A61G *17/00*
U.S. Cl. 27—10 **12 Claims**



1. A casket comprising sheet metal side and end panels, a continuous tensioning member extending around the periphery of the casket and corner brackets located at corners between the side and end panels, the side and end panels of which form an enclosure, the continuous tensioning member of which is located interiorly of the enclosure, and the corner brackets of which have portions thereof outside the enclosure and portions thereof inside the enclosure, with the portions inside the enclosure being held in tension and being pulled inwardly, with respect to the enclosure, by the tensioning means, so that the brackets are pulled into contact with the outer portions of the side and end panels and bring said side and end panels into contact with each other and hold them together.

3,962,762

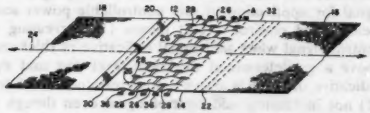
METHOD OF MAKING A FABRIC SPLICE

Alexander V. Alexeff, Cleveland, Ohio, assignor to Alexeff-Snyder Enterprises, Inc., Cleveland, Ohio

Division of Ser. No. 376,537, July 5, 1973, Pat. No. 3,885,596.
This application Nov. 11, 1974, Ser. No. 522,515
Int. Cl.² B65H *69/06*; D03D *23/00*
U.S. Cl. 28—72 R **11 Claims**

1. A method of making a splice between contacting overlapped fabric end portions defining a fabric double layer having a longitudinal axis and a lapping plane, comprising the steps of; forming a plurality of transverse rows of loops in said double layer with each row including a plurality of partial

loops extending alternately in opposite directions out of said plane transversely of said longitudinal axis, each said partial loop including the contacting fabric of both said overlapped



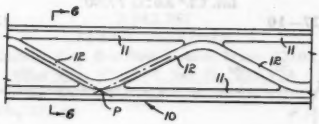
fabric end portions, and inserting elongated substantially rigid rod means through said partial loops in each of said loop rows to hold said fabric end portions together.

3,962,763

TRUSS-LIKE METAL MEMBER

Harold Rex Jury, 23 Kensington Road, Norwood, South Australia

Filed July 13, 1971, Ser. No. 162,213
Claims priority, application Australia, July 16, 1970, 1860/70
Int. Cl.² E04B 1/18
U.S. Cl. 29—6.1 12 Claims



1. A method of forming a metal member of a truss-like configuration having spaced chords interconnected by a plurality of struts, comprising the steps of:

a. extruding ductile metal to form a member of constant cross-sectional shape with two longitudinally extending chord forming portions and a longitudinally extending outstanding stiffening portion parallel to and between the chord forming portions,

b. forming a plurality of longitudinally extending rows of spaced slots in the member, each slot having spaced parallel sides and curved ends, the slots of each row being staggered relative to the respective slots of the next adjacent row and being separated therefrom by the stiffening portion, the centre distance between any two adjacent slots in any one row exceeding the length of each of said adjacent slots but being less than their combined lengths so that the slots of adjacent rows overlap thereby dividing the stiffening portion into a series of strut forming portions and forming between the adjacent slots a series of web portions, each strut forming portion having respective least radii of gyration of cross-sectional shape which exceed the least radius of gyration of cross-sectional shape of each web-forming portion but the effective cross-sectional area of each web-forming portion exceeding the cross-sectional area of each strut-forming portion sufficiently to compensate for its reduced radius of gyration when subjected to buckling loads,

c. clamping substantially only respective chord forming portions along their longitudinal extent in an elongation means, and

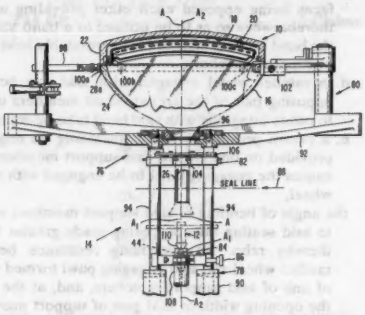
d. operating said elongation means so as to move said clamped chord forming portions apart to elongate said strut forming portions and form struts and chords, the struts being inclined to the chords.

3,962,764

METHOD OF INSTALLING A MOUNT ASSEMBLY IN A MULTI-BEAM CATHODE RAY TUBE

John Franklin Stewart; Raymond Arthur Alleman, and Morris Robert Weingarten, all of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 15, 1975, Ser. No. 541,087
Int. Cl.² H01J 9/18
U.S. Cl. 29—25.13 10 Claims



1. A method of assembling a cathode ray tube, said tube including a bulb assembly and a mount assembly, said bulb assembly having a central longitudinal axis and including a faceplate panel having a transverse axis, said mount assembly having a central longitudinal axis and including a multi-beam electron gun assembly having at least two reference points on the structure thereof, said reference points being spaced from each other and radially spaced around the central longitudinal axis of said mount assembly, said method comprising the steps of:

a. positioning said bulb assembly in a predetermined orientation;

b. positioning said mount assembly in a location spaced from said bulb assembly with the central longitudinal axis thereof coincident with the central longitudinal axis of said bulb assembly;

c. optically sensing the rotational position of said electron gun assembly about said coincident longitudinal axes with respect to said positioned bulb assembly by comparing the relative positions of said reference points on an optical display;

d. adjusting the relative positions of said reference points on the optical display by rotating said mount assembly about said coincident longitudinal axes until said reference points are in predetermined relative positions whereby said electron gun assembly is at a prescribed rotational orientation with respect to said bulb assembly;

e. then, while maintaining said rotational orientation, moving said mount assembly along said longitudinal axis to a desired longitudinal location with respect to the faceplate panel of said bulb;

f. and then permanently fixing said mount assembly to said bulb assembly.

3,962,765

METHOD OF INSTALLING A MOUNT ASSEMBLY IN A MULTI-BEAM CATHODE RAY TUBE

Charles Peter Stachel, Clarks Summit, and Morris Robert Weingarten, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed June 27, 1975, Ser. No. 590,921
Int. Cl.² H01J 9/18
U.S. Cl. 29—25.13 18 Claims

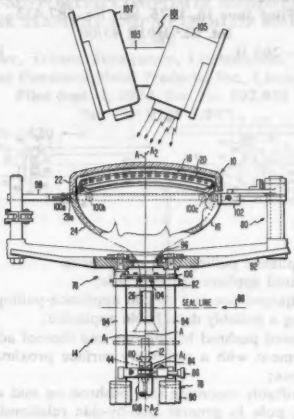
1. A method of assembling a cathode ray tube, said tube including a bulb assembly and a mount assembly, said bulb

assembly having a central longitudinal axis and including a faceplate panel having a plurality of phosphor deposits disposed thereon in a predetermined pattern, said mount assembly having a central longitudinal axis and including a multibeam electron gun assembly, said method comprising the steps of:

a. positioning the central longitudinal axis of said bulb assembly in a predetermined orientation;

b. optically sensing the rotational position of said phosphor pattern about the central longitudinal axis of said bulb assembly;

c. positioning said bulb assembly about the central longitudinal axis thereof so that said phosphor pattern is at a predetermined rotational position;



d. positioning said mount assembly in a location spaced from said bulb assembly with the central longitudinal axis thereof coincident with the central longitudinal axis of said bulb assembly;

e. optically sensing the rotational position of said electron gun assembly about said coincident longitudinal axes;

f. rotating said mount assembly about said coincident longitudinal axes until said electron gun assembly is at a prescribed rotational orientation with respect to said phosphor pattern;

g. then, while maintaining said rotation orientation, moving said mount assembly along said longitudinal axis to a desired longitudinal location with respect to the faceplate panel of said bulb; and

h. permanently fixing said mount assembly to said bulb assembly.

3,962,766

PROCESS FOR ASSEMBLING TUBES OF PLASTICS MATERIAL AND ASSEMBLIES RESULTING FROM SAID PROCESS

Guy Pompidor, and Jean-Luc Serriere, both of Pont-a-Mousson, France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed May 31, 1974, Ser. No. 475,227

Claims priority, application France, June 8, 1973, 73.20913

Int. Cl.² B21D *53/02;* **B29C** *27/22;* **B29D** *23/04*

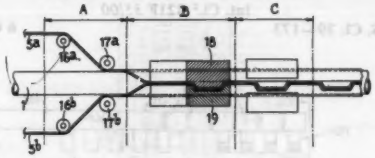
U.S. Cl. 29—157.3 B **6 Claims**

1. Process for manufacturing a heat exchanger having parallel tubes and radiating plates assembled with the tubes, comprising

simultaneously extruding in extruders a series of coplanar laterally spaced-apart parallel tubes of thermoplastic material having an elastic memory;

simultaneously drawing by pulling the extruded tubes through die heads coaxial with the outlets of the extruders and having a cross-sectional size less than the cross-sectional size of the tubes issuing from the extruders, the tubes being cooled down to a temperature in the neighbourhood of the softening point of said material before entering the die heads;

simultaneously passing the tubes issuing from the die heads through a cooling tank while maintaining the pulling force on the tubes;



feeding two radiating plates on both sides of the series of tubes issuing from the tank in contact with opposed generatrices of the tubes;

press-forming the two plates so that the plates conform to the shape of the tubes and come in contact with each other in regions thereof corresponding to the lateral spaces between the tubes;

fixing the plates together in said regions, and reheating the assembly of the tubes and the plates to said temperature.

3,962,767

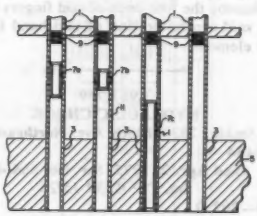
METHOD FOR REPAIRING A HEAT EXCHANGER TUBE

Wilbur M. Byerley, Riverview; Raymond H. Glatthorn, St. Petersburg, both of Fla., and Emil P. Lock, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1974, Ser. No. 497,180

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 R **7 Claims**



1. A method for repairing a defective portion of a tube disposed in a tube sheet in a heat exchanger, said method comprising the steps of:

removing scale and oxidation products from the inner surface of at least a portion of said tube,

severing said tube so as to form a gap therein,

with the tube sheet as a reference point inserting a sleeve into said tube so that the leading edge of said sleeve is disposed beyond the area where said tube was severed and beyond the defective portion,

expanding at least a portion of said sleeve into engagement with said tube,

flooding at least the portion of said tube containing said sleeve with a gas suitable for welding said sleeve to said tube,

welding the leading edge of said sleeve to said tube and,

forming the sleeve from material suitable as a filler metal when welding two tubes together

forming the sleeve so as to be sufficiently long and locating the sleeve so that it covers the defective portion of the tube and the gap, and

welding the trailing end of the sleeve to the tube.

3,962,768

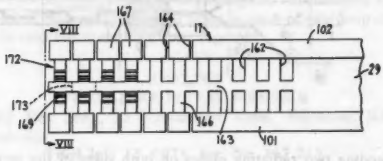
METHOD OF MAKING TAPE SPRING

Michael Lusko, 25330 John R, Madison Heights, Mich. 48071

Filed Feb. 10, 1975, Ser. No. 548,614

Int. Cl.² B21F *35/00*

U.S. Cl. 29—173 **6 Claims**



1. In a process for fabricating spring means for positioning within a cartridge having a tape capable of recording electromagnetic impulses, the steps comprising:

applying a pair of elongated flexible elements to one side of an elongated, relatively thin band of resiliently flexible material, said elements being parallel, substantially spaced from each other and located adjacent the lengthwise edges of said band;

providing said band with a plurality of uniformly spaced notches in both edges thereof and severing said elements adjacent said notches, said notches extending inwardly to a lengthwise central portion of said band to define a plurality of parallel and spaced, spring fingers arranged in transversely aligned pairs extending in opposite directions from said central portion of said band;

sequentially applying first distortions to said spring fingers; and

sequentially applying second distortions to said spring fingers whereby the free ends of said fingers are offset relative to said central portion of said band in the direction of said elements.

3,962,769

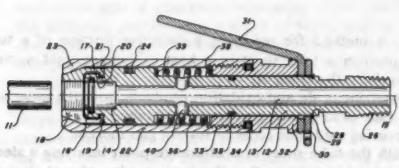
HYDRAULIC CHUCK

George R. Smida, 2039 105th Ave. Northeast, Minneapolis, Minn. 55434

Filed Apr. 2, 1975, Ser. No. 564,415

Int. Cl.² B23P *15/26*

U.S. Cl. 29—202 D **5 Claims**



1. A hydraulic chuck, comprising:

piston means having an axially centered passage, the first end of said piston means being sized to engage a tube;

collet means located at said first end of said piston means for engagement of said tube upon closure of said collet means;

surface means bearing upon said collet means to close said collet means;

biasing means operably connected to said piston means for normally forcing said surface means upon said collet means;

attachment means operably connected to said biasing means to remove said surface means from said collet means to permit insertion of said tube; and

passage defining means in said piston to force said surface means on said collet means upon passage of fluid in said axially centered passage.

3,962,770

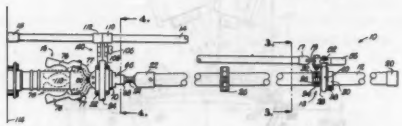
ELBOW PULLER

James P. Dooley, Peoria, Ill., and Roger O. Dake, Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed June 16, 1975, Ser. No. 587,433

Int. Cl.² H01R *43/00*

U.S. Cl. 29—203 H **17 Claims**



1. An appliance pulling tool, comprising:

an elongated appliance-pulling pole;

means adjacent one end of said appliance-pulling pole for gripping a pullably detachable appliance;

an elongated pushrod having one end thereof adapted for engagement with a stationary surface proximal to said appliance;

means shiftably mounting said pushrod on said appliance-pulling pole in general side-by-side relationship therewith, with said appliance-gripping means and surface-engaging end being proximally disposed,

said mounting means including an elongated link pivotally connected to said appliance-pulling pole and pushrod respectively; and

operating means for pivoting said link about an axis to produce a pushing force on said pushrod towards said stationary surface and a corresponding pulling force on said appliance-pulling pole.

3,962,771

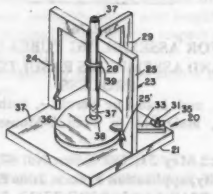
STONE AND ROD HOLDER DEVICE

Roy Lines, Box 383, Oriska, N. Dak. 58063

Filed July 3, 1975, Ser. No. 592,919

Int. Cl.² B23Q *1/00, 3/00*

U.S. Cl. 29—283 **1 Claim**



1. A holder device for holding and aligning a stone and rod for attachment together comprising a platform with marking means on the platform extending out from the center of the platform for aligning a stone thereon, with the center of the stone centrally on the platform, clamp means to secure a stone aligned on the platform, a support member extending upward

from the side of the platform over the center of the platform, an elongated channel member fixed to the support member at the center of the platform and extending vertically downward toward the center of the platform with its lower edge terminating at a location above the platform, said elongated channel member receiving said rod therein, whereby a stone may be aligned with at least the approximate center of the stone centrally on the platform and the rod may be glued to the stone while positioned in the channel member until the glue is hardened, whereupon the rod and stone may be removed with the rod attached centrally and perpendicularly to the stone and the rod may be used to rotate the stone for grinding and shaping the stone.

3,962,772

SHAFT-SUPPORTED COMPOSITE HIGH-STRENGTH MACHINE ELEMENT AND METHOD OF MAKING THE SAME

John Haller, Triesen Furstentum, Liechtenstein, assignor to Michigan Powdered Metal Products, Inc., Livonia, Mich.

Filed Sept. 4, 1974, Ser. No. 502,938
Int. Cl.[2] B22F 3/24
U.S. Cl. 29—420 **5 Claims**

1. A shaft-supported composite machine element, comprising

an elongated supporting shaft of non-porous solid metal having a roughened area with a multiplicity of locking recesses in said shaft and with a plurality of shoulders extending across said shaft,

and an enlarged separate peripheral motion-transmitting body of solidified sintered powdered metal hot-forgedly secured to said shaft and extending laterally outward therefrom around said roughened area and extending axially along a part only of said shaft with the metal of said peripheral body extending into said recesses and against said shoulders and thereby inseparably interlocked by said recesses and shoulders with the metal of said roughened area and with another part of said shaft projecting from at least one of said peripheral body.

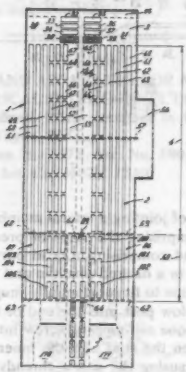
3,962,773

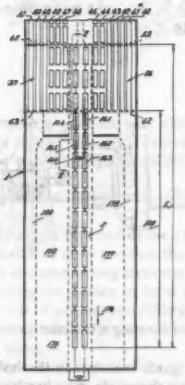
METHODS FOR THE MANUFACTURE OF PREFABRICATED BUILDING SECTIONS OR ROOM UNITS AND FACTORIES FOR THE IMPLEMENTATION OF SUCH METHODS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Sept. 19, 1973, Ser. No. 398,866
Claims priority, application Netherlands, Sept. 19, 1972, 7212651
Int. Cl.[2] B23P 15/00, 19/04; E04G 21/14
U.S. Cl. 29—430 **18 Claims**

1. A method for the manufacture of prefabricated building sections on a production line, the method comprising the steps of producing prefabricated panels in a manufacturing part of the production line, making such panels which are intended for use as floor panels and ceiling or roof panels in an elongated rectangular shape in said manufacturing part while being maintained in a predetermined relative orientation, storing said floor panels and ceiling or roof panels in substantially said predetermined relative orientation proximate said production line, conveying said floor panels and ceiling or roof panels while substantially in said predetermined relative orientation to a location beside an assembly station, conveying said floor panels and said ceiling or roof panels to said assembly station while maintaining them in said predetermined relative orientation, assembling said prefabricated panels in at least one assembly jib at said assembly station while arranging





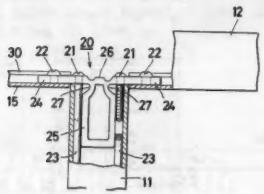
and holding said panels in said jig in substantially said predetermined relative orientation, securing said floor panels and said ceiling or roof panels and wall panels to one another in said jig, said floor panels and said ceiling or roof panels being substantially in said predetermined relative orientation while and immediately after being so secured to form the sections in a basically completed structural condition, and moving said basically completed structural sections out of said assembly jig for finishing operations on a further part of the production line.

3,962,774

METHOD OF INTERLOCKING A LATERAL MEMBER AND THE END OF A HOLLOW POST

Tadaomi Noro, 19-3 Tsurukawa 4 chome, Machida, Tokyo, Japan

Filed Mar. 19, 1975, Ser. No. 559,812
Int. Cl.² B23P 11/00
U.S. Cl. 29—432 3 Claims



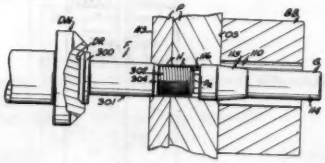
1. A method of jointing a lateral member and one end of a hollow post comprising the steps of pressing the stud body portion of a stud comprising a head portion for holding the lateral member in a desired position and a stud body portion of a size and shape to fit substantially snugly against the inner walls of the hollow post into the end of the hollow post and driving at least one self-tapping screw into and along at least one gap between the stud and the inner wall of the hollow post, thereby causing the screw threads of the self-tapping screw to bite into the stud and the inner wall of the hollow post.

3,962,775

METHOD OF FORMING A JOINT USING A GUIDE FASTENER

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Filed Jan. 17, 1975, Ser. No. 542,076
Int. Cl.² B23P 9/00
U.S. Cl. 29—445 6 Claims



1. A method of forming a fastener joint comprising the steps of:

a. inserting a guide member in the holes through the work pieces where the guide member has a pilot section with a diameter such that the pilot section is slidably received through the holes at their initial diameter and locates the central axis of the guide member substantially coaxially with the centerline of the holes, and an expansion section with a major diameter larger than the initial diameter of the holes;

b. coaxially aligning a fastener to be installed in the holes with the leading end of the fastener at the trailing end of the guide member; and,

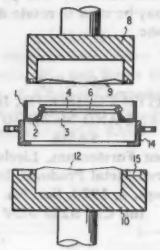
c. forcing the guide member through the holes and the fastener into the holes with the guide member immediately preceding the fastener through the holes.

3,962,776

METHOD OF MAKING AN OIL SEAL

Yasuo Mikami, Fujisawa, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1975, Ser. No. 557,298
Claims priority, application Japan, Mar. 14, 1974, 49-29484
Int. Cl.² B23P 11/00
U.S. Cl. 29—458 5 Claims



1. A method of producing an oilseal comprising the steps of:

providing a metallic ring having a flange projecting in the direction of the diameter of the ring;

providing a resilient oilseal main body having a lip, the surface of which generates a lip line;

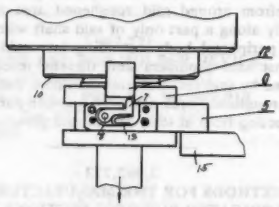
integrally molding said oilseal main body to the edge of said flange; then plastically deforming at least one portion of said flange so as to impart a curvature section to the lip line.

3,962,777

TOOL CLAMPING DEVICE FOR MULTIPLE-OPERATION MACHINES

Nikola Dimov Stollov, Sofia, Bulgaria, assignor to Institute za Metalloobraborvashti Machini, Sofia, Bulgaria

Filed Dec. 19, 1974, Ser. No. 534,439
Claims priority, application Bulgaria, Dec. 19, 1973, 25288
Int. Cl.² B23Q 1/155; B23B 39/00, 31/06
U.S. Cl. 29—568 3 Claims



1. In the combination of a multiple-operation machine having a spindle with a pair of face keys and a tool changer therefor, an improved tool clamping device, comprising a self-blocking fork having a pair of arms adapted partially to embrace the shanks of a tool, wherein in both arms of the fork there being profile grooves, blocking pins pivotally mounted in respective ones of the grooves and springs between the blocking pins and the bottom wall of the grooves for continually pressing the blocking pins toward their tool blocking positions, the blocking pins having portions which are so disposed as to be engageable by the face keys on the spindle of the multiple-operation machine upon the approach of a spindle to the tool-changing position of the tool clamping

device, thereby to thrust the blocking pins to the tool unblocking position.

3,962,778

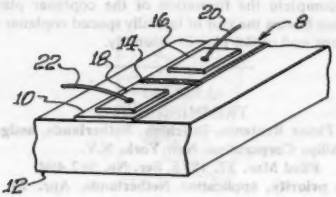
PHOTODETECTOR ARRAY AND METHOD OF MANUFACTURING SAME

John P. Palmer, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Continuation-in-part of Ser. No. 425,429, Dec. 17, 1973, abandoned, which is a division of Ser. No. 352,777, April 19, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,716

Int. Cl.² B01J 17/00; H01L 15/02

U.S. Cl. 29—572 7 Claims



1. A method of manufacturing a photoconductive array cell comprising the steps of:

depositing a thin film of photosensitizable semiconductor material on an insulative material substrate;

diffusing an impurity into a defined portion of said photosensitizable thin film to photosensitize said defined region;

depositing thin film metal electrode pads on said photosensitizable thin film around the photosensitized portion of said photosensitizable thin film, with said photosensitized portion being noncontiguous with said electrode pads defining only a small portion of the area between said electrode pads; and

bonding a metal wire lead to each of said electrode pads.

3,962,779

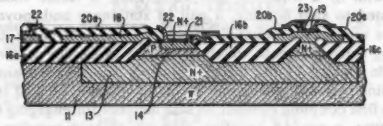
METHOD FOR FABRICATING OXIDE ISOLATED INTEGRATED CIRCUITS

Roger Edwards, Gillette; William Joshua Evans; Wesley Norman Grant, both of Berkeley Heights, and Bernard Thomas Murphy, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 432,896, Jan. 14, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,445

Int. Cl.² B01J 17/00

U.S. Cl. 29—577 3 Claims



1. A method for fabricating a semiconductive integrated circuit comprising the steps of

preparing a semiconductive element which includes on one surface a plurality of semiconductive regions which are separated at such surface by dielectric isolation regions,

forming directly on said surface a first metallization pattern,

depositing an insulating layer over said surface including the first metallization pattern,

forming openings in the insulating layer for exposing at least one portion of said first metallization pattern and a portion of at least one semiconductive region,

introducing impurities into the exposed portions of said semiconductive region for affecting their conductivities,

and forming over said surface, including the first metallization pattern and the insulating layer, a second metallization pattern without reforming the openings in said insulating layer,

said second metallization pattern making electrical connection to the exposed portions of the semiconductive regions and of the first metallization pattern through the openings in the insulating layer.

3,962,780

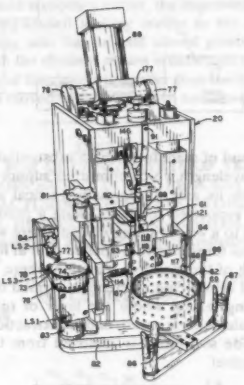
METHODS AND APPARATUS FOR MAKING ELECTRICAL INTERCONNECTIONS

Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 26, 1975, Ser. No. 590,707

Int. Cl.² H02K 15/00

U.S. Cl. 29—596 10 Claims



1. A method of making at least two different electrical interconnections with at least two wires extending from windings supported on the core of a dynamoelectric machine, the method comprising:

moving the core, windings, and at least two wires toward a wire connecting device;

orienting and positioning a first one of the at least two wires relative to the device so as to position the first one of the at least two wires at a connecting station of the device and thereby conditioning the device to form a first interconnection of a first one of at least two different interconnection configurations while so positioning the first one of the at least two wires;

forming a first electrical interconnection, involving the first one of the at least two wires, and with the first electrical interconnection having the first one of the at least two interconnection configurations, at the connecting station of the device;

orienting and positioning a second one of the at least two wires relative to the device so as to position the second one of the at least two wires at a connecting station of the device and thereby conditioning the device to form an interconnection of a second one of at least two different interconnection configurations while so positioning the second one of the at least two wires;

forming an electrical interconnection, of the second one of the at least two interconnection configurations and in-

volving the second one of the at least two wires, at the connecting station of the device; and,

moving the core, windings, at least two wires, and electrical interconnections away from the device.

3,962,781

ELECTROMAGNETIC WAVEGUIDES

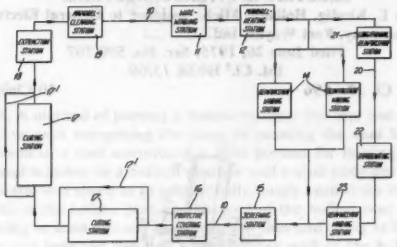
Alexander Joseph Moore, Marlow; David Alexander Taylor, Kenton, and David James Greene, Harrow, all of England, assignors to BICC Limited, London, England

Filed Mar. 25, 1975, Ser. No. 562,000

Claims priority, application United Kingdom, Mar. 29, 1974, 14174/74

Int. Cl.² H01P 11/00

U.S. Cl. 29—600 27 Claims



1. A method of manufacturing a substantially rigid electromagnetic wavelength which comprises supporting an elongate mandrel with its axis substantially vertical and causing the mandrel so supported to travel along a predetermined path successively to a wire-winding station where a layer of closely wound helical turns of wire is applied over at least a major part of the length of the mandrel, a station where a layer of resin-impregnated reinforcing elements is formed over the layer of wire, a curing station where the layer of resin-impregnated reinforcing elements is cured, and an extraction station where the waveguide so formed is removed from the substantially vertical mandrel.

3,962,782

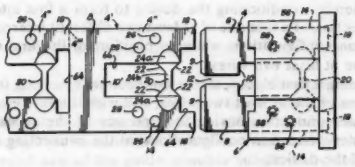
METHOD OF MAKING A MINIATURE PLUG-IN FUSE

Harold L. Williamson, Northbrook, and Avinash P. Aryamane, Mt. Prospect, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Division of Ser. No. 432,980, Jan. 14, 1974, Pat. No. 3,909,767. This application Sept. 8, 1975, Ser. No. 610,978

Int. Cl.² H01H 69/02

U.S. Cl. 29—623 18 Claims



1. The method of making a plug-in assembly comprising a plug-in element including a coplanar plate-like body means having a pair of laterally spaced coplanar terminal forming blade portions to be received by pressure clip terminals in a mounting panel and coplanar current carrying extensions at the inner end portions of the pair of terminal forming blade portions, and a synthetic plastic housing which is open at the inwardly facing side thereof and which contains the coplanar plate-like body means of the plug-in element with the current carrying extensions thereof within the housing and with the pair of terminal forming blade portions thereof extending outwardly therefrom through the opening therein, said method comprising the steps of providing a blank containing the pair of laterally spaced coplanar terminal forming blade portions which are interconnected by a transverse web and the coplanar current carrying extensions thereof involved in the coplanar plate-like body means of the plug-in element, inserting over said blank the synthetic plastic housing by way of the opening at the inwardly facing side thereof with the current carrying extensions of the blank within the housing and with the pair of terminal blade portions of the blank, which are interconnected by the transverse web, extending outwardly from the housing through the opening therein, securing said blank in the synthetic plastic housing, and blanking the exposed transverse web interconnecting the terminal blade portions to complete the formation of the coplanar plate-like body means having the pair of laterally spaced coplanar terminal portions and of the plug-in assembly.

3,962,783

TRIMMING UNIT

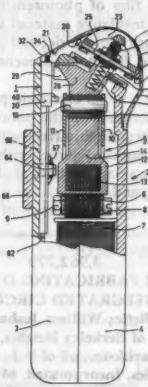
Albertus Pieter Rentema, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,494

Claims priority, application Netherlands, Apr. 29, 1974, 7405728

Int. Cl.² B26B 19/10

U.S. Cl. 30—34.1 6 Claims



1. In an electric shaver including a housing, an electric motor with a reciprocating armature in said housing, and a shaving head with a shaving cutter therein coupled to and driven by said armature, the improvement in combination therewith of a trimming unit comprising: a frame slidably mounted to said housing, a pair of stationary and movable blades removably mounted on said frame, said blades each having a row of teeth which cooperate in cutting action, a spindle carried by the frame, coupling means comprising a coupling member axially and pivotally movable on said spindle, a first coupling element on said member for engaging said armature, a second coupling element on said member for engaging said movable blade, said frame being slidable between its inactive position wherein said first coupling element is spaced from said armature and its active position wherein said first coupling element is engaged to said armature, said coupling member being pivotable between closed position wherein its second coupling element engages the movable blade, and open position wherein said coupling member is pivoted away from said movable blade allowing easy removal of said two blades from said frame, and helical spring means

around said spindle and engaging said frame and also engaging said coupling member, said spring means resiliently urging said coupling member into its closed position and against said movable blade, which is thereby resiliently urged against said stationary blade when said frame is in its active position.

3,962,784

DRY-SHAVING APPARATUS

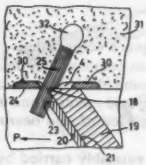
Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,165

Claims priority, application Netherlands, Apr. 5, 1974, 7404657

Int. Cl.[2] B26B *19/14*

U.S. Cl. 30—43.6 12 Claims



6. In an electric shaver for cutting hairs and including a housing, an electric motor mounted in said housing, a comb carried by said housing, the comb having lamellae defining apertures between each two adjacent lamellae for receiving said hairs with an outer, exposed surface of said lamellae and an opposite inner surface of said lamellae, a cutter coupled to and driven by said motor in a predetermined direction, the cutter having blades extending therefrom with a top surface of each blade for engaging said inner surface of said comb lamellae, and means for resiliently urging said cutter blades against said inner surface of the lamellae, the improvement in combination therewith wherein said cutter-blade top surfaces define a plane generally parallel to said lamellae inner surface, each cutter blade has a lead surface in the direction of motion, and a cutting edge formed at the intersection of said top and lead surfaces, with an angle $Q \leq 90°$ defined between said top and lead surfaces, said improvement further comprising a hair puller secured to said cutter, with a hair puller blade adjacent each cutter blade, each hair puller blade having a top surface generally parallel to said cutter blade top surfaces, a lead surface in the direction of motion, and an opposite trailing surface in sliding engagement with said lead surface of the adjacent cutter blade, said hair pulled blade top surface being normally in said plane of said cutter blade top surface, and being movable in a direction away from said plane and being resiliently loaded in the direction toward said plane.

3,962,785

ELECTRIC TRIMMER

Hendrik Poel, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

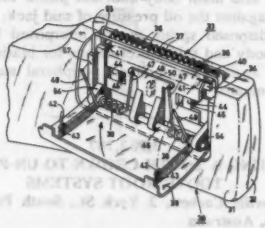
Filed Mar. 25, 1975, Ser. No. 561,874

Claims priority, application Netherlands, Apr. 8, 1974, 7404738

Int. Cl.[2] B26B *19/20, 19/10*

U.S. Cl. 30—90 12 Claims

1. In an electric trimmer including a housing with a longitudinal dimension which is suubstantially greater than its traverse dimension, an electric drive motor mounted in the housing, a trimming cutter set partially within the housing which comprises a stationary cutter and cooperating therewith a drivable cutter which is reciprocatable by the motor, which cutters are each provided with a row of teeth and together are disposed near one end of the housing in such a way that the rows of teeth project out of the housing, and resilient means for resiliently pressing the two cutters against each other, the improvement in combination therewith comprising a flap hingeably connected to said housing and movable between open and closed positions, the flap in closed position covering the part of the trimming cutter set located in the housing, said resilient means situated adjacent said flap and said drivable cutter, said flap in closed position engaging and deflecting said



resilient means which thereby resiliently urges said drivable cutter towards said stationary cutter, the improvement further comprising spring-loaded locking means in the housing for releasably locking said flap in said closed position, the distance over which the resilient means is deflected to obtain the resilient loading of the cutters is smaller than the distance over which the flap is moved between its open and closed positions.

3,962,786

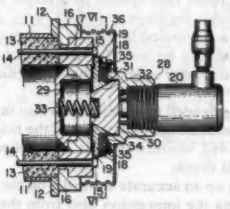
APPARATUS FOR CUTTING RIVETS OF TENSIONED REINFORCEMENT IN THE PROCESS OF MANUFACTURING CONCRETE PRODUCTS

Takemitsu Mori, Hachioji, and Katsunori Miyata, Hoya, both of Japan, assignors to Nippon Concrete Industries Co. Ltd., Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,369

Int. Cl.[2] B26B *7/00*

U.S. Cl. 30—168 3 Claims



1. Apparatus for cutting rivets, formed upon the ends of tensioned reinforcements, which protrude beyond the surface of an annular tension plate used for tensioning said reinforcements in order to increase the strength of a concrete product, comprising:

a main body co-axially aligned with said tension plate and having one end thereof disposed interiorly of said tension plate, the diameter of said body being substantially the same as, or slightly less than, that of said tension plate whereby said body is in peripheral contact with the inner surface of said tension plate so as to stabilize said main body, with respect to said tension plate and said concrete product, when said apparatus cuts said rivets;

a plurality of radially extending chisel means slidably disposed, within said main body and along the outer radially disposed end surface of said tension plate for simultaneously engaging and cutting said rivets, the radially inner ends of said chisel means having inclined surfaces;

an oil pressure jack operatively connected to the other end of said main body;

a piston slidably disposed within said main body and operable by means of said oil pressure of said jack;

said piston having a substantially frusto-conical configuration so as to include a substantially conical peripheral surface which simultaneously operatively engages said inclined surfaces of said chisel means;

axially disposed spring means interposed between said one end of said main body and said piston for biasing said piston against the oil pressure of said jack; and

radially disposed spring means interposed between said main body and said chisel means for biasing said chisel means against the inclined peripheral surface of said piston means.

3,962,787

ATTACHING A TOOTH CROWN TO UN-PARALLEL TOOTH ROOT SYSTEMS

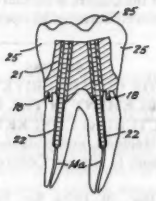
Andrew Neville Corbett, 2 York St., South Perth, Western Australia, Australia

Filed Dec. 20, 1974, Ser. No. 535,030

Claims priority, application Australia, Dec. 27, 1973, 6108/73

Int. Cl.² A61K 5/01

U.S. Cl. 32—15 9 Claims



1. A method for attaching a tooth crown to a parallel or non-parallel tooth root system or a single rooted tooth comprising the following steps:

a. drilling a pin-mated hole in at least one of the root filled tooth roots to be used for fixation of the crown to the desired diameter or length and in the direction of the root canal;

b. inserting headed impression pins into the prepared holes;

c. taking an accurate impression of the respective tooth with the headed impression pins in position in the tooth to their full depth;

d. pouring up an accurate stone die on the said impression;

e. removing the impression pins from the die and inserting the matching final retentive pin to be used into the hole provided;

f. positioning a tube adjusted to the correct length over the said final retentive pin; said tube having a melting point substantially greater than that of the metal to be used for the casting of the crown;

g. waxing up the desired shape of the requisite casting around said tube;

h. removing the final retentive pin from the root canal holes through the tube;

i. sprewing the wax pattern and casting said pattern in the desired material around said high melting point tubes;

j. dissolving out the tubes within the casting;

k. locating the casting in position on the tooth root and passing final retentive pins through each of said tubes into the root canals;

l. cementing the pins in position through the tubes and into the root canals;

m. and cementing a crown over the cast core.

3,962,788

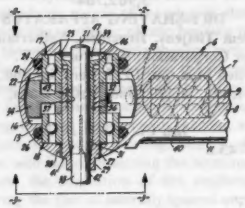
DENTAL HANDPIECE

Lloyd P. Flatland, 15 Quisisana Drive, Kentfield, Calif. 94904

Filed Jan. 4, 1974, Ser. No. 430,742

Int. Cl.² A61C 1/10

U.S. Cl. 32—27 1 Claim



1. A dental handpiece comprising:

a housing having an opening therethrough and having a pair of bearings mounted therein in alignment on an axis extending along said opening and adjacent opposite ends of said opening each of said bearings having a rotatable inner race;

a hollow spindle rotatably carried by said inner races, extending through one of said inner races and outwardly of said housing at one end of said opening and terminating at its other end between the ends of the other inner race, said spindle having an interior taper portion and interior threads;

a chuck tube having an exterior taper portion engaging said interior taper and external threads engaging said internal threads, said chuck tube having a cylindrical bore of uniform diameter completely therethrough and terminating at one end in a flange extending outwardly thereof adjacent said other end of said hollow spindle and between said ends of the other inner race; and tool engaging means on said flange outwardly of said bore.

3,962,789

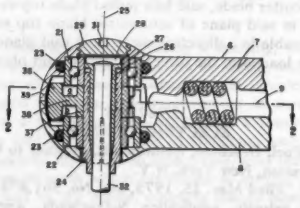
DENTAL HANDPIECE

Lloyd P. Flatland, 15 Quisisana Drive, Kentfield, Calif. 94904

Filed Apr. 8, 1974, Ser. No. 458,792

Int. Cl.² A61C 1/10

U.S. Cl. 32—27 5 Claims



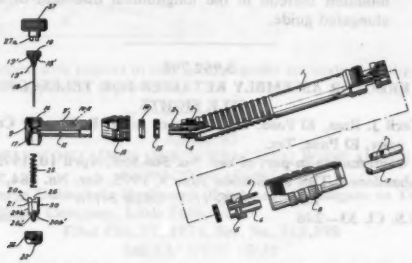
1. A dental handpiece comprising a housing defining a rotor chamber, an inlet duct leading through a nozzle opening into said chamber and an outlet duct opening from said chamber; a spindle mounted in said housing for rotation in said chamber about an axis; and a rotor in said chamber and mounted on said spindle, said rotor including an annular hub engaging and extending along said spindle for a predetermined axial distance, an annular web in a plane normal to said axis and extending radially from said hub and extending axially less than said distance, and circumferentially spaced axial blades extending radially from the outer edge of said web and extend-

ing an axial distance more than said web to leave rotor chambers on opposite sides of said web in communication with spaces between said blades.

3,962,790
ENDODONTIC INSTRUMENT

Francesco Riitano, Soverato, and Nino Cassani, Bologna, both of Italy, assignors to s.r.i. C.I.R. (Cooperativa Industriale Romagnola), Italy, Italy and Dott. Francesco Riitano, both of, Italy

Filed June 25, 1974, Ser. No. 483,035
Claims priority, application Italy, June 27, 1973, 3440/73
Int. Cl.² N61C 17/00
U.S. Cl. 32—40 R **5 Claims**



1. An endodontic instrument, comprising;

a head, defining an irrigation inlet chamber and, coaxially therewith, an aspiration outlet chamber, the head having a plurality of irrigation inlet ducts separate from one another, communicating with the inlet chamber, and aspiration outlet duct means communicating with the outlet chamber;

a hollow irrigation needle coaxially secured to the head, having a needle inlet section communicating with the inlet chamber, the needle extending into, through and outwardly from the outlet chamber, said chamber being sealed from the inlet chamber and needle;

an aspiration sleeve coaxially surrounding the needle, surrounded by a part of the head which includes the outlet chamber, and extending outwardly from said part along a portion of the needle, said sleeve being coaxially slidable in the head, from a lowermost position of the sleeve to an uppermost position thereof relative to the head, the sleeve being apertured, on the outside of the head, for aspiration of fluid into the sleeve; and

resilient means in the outlet chamber for urging the sleeve toward its lowermost position relative to the head to enable a point of the needle resiliently to penetrate variously from the sleeve into a radicular canal of a tooth to be treated while the sleeve remains in a fixed position at an opening of a pulp cavity of the tooth.

3,962,791
STOP FOR THE SHAFT OF A ROOT-CANAL INSTRUMENT

Eduard Zdarsky, Brautigamstr. 5, 8 Munich 71, Germany

Filed Jan. 22, 1975, Ser. No. 542,933
Claims priority, application Germany, Jan. 29, 1974, 2404151
Int. Cl.² A61C 5/02
U.S. Cl. 32—57 **10 Claims**

1. In combination with a shaft of a root-canal tool, a stop, said stop comprising:

an abutment element formed with a throughgoing hole of larger diameter than said shaft and having an abutment face, said hole defining an axis generally perpendicular to said face; and

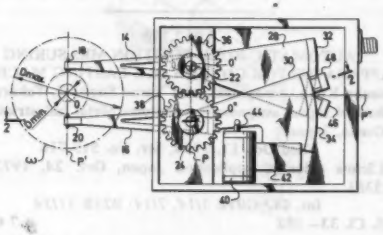
a multiturn coil spring secured to said element and having a throughgoing passage aligned with said axis and having a fully contracted inside diameter slightly smaller than

that of said shaft, whereby a shaft fitted axially through said stop is tightly gripped by said spring and said spring is expanded by said shaft.

3,962,792
APPARATUS FOR MEASURING THE DIAMETER OF A WORKPIECE

Karel Štěpánek, and Václav Ruckl, both of Prague, Czechoslovakia, assignors to Vyzkumny ustav obrabechlich stroju a obrabeni, Prague, Czechoslovakia

Filed Apr. 3, 1974, Ser. No. 457,417
Claims priority, application Czechoslovakia, Apr. 6, 1973, 2471-73
Int. Cl.² G01B 7/12
U.S. Cl. 33—143 L **7 Claims**



1. Apparatus for measuring the diameter of a work piece comprising a pair of extending arms, each of said arms being mounted at one end on a shaft rotatable about an axis parallel to the longitudinal axis of the work piece and having a contact mounted at its other end for engagement with said work piece, coupling means for causing each of said respective arms and associated shafts to simultaneously move with respect to each other about the axis of the respective shafts in response to the engagement of said contact with said work piece, a segment member connected to each of said arms for conjoint movement therewith having a circumferential edge coaxial with the axis of rotation, each of said segments having means for producing a magnetic field variable along the length of its circumferential edge, and a pair of magnetic sensing heads respectively spaced from each of said circumferential edges at a given point to sense the respective magnetic fields at said given point and means for evaluating each of said fields and for determining the angular relationship between said segments and between said arms.

3,962,793

METHOD FOR DETERMINING INITIAL VELOCITY FOR A RAPID FIRE GUN

Frank R. Blume, Jeffersontown, Ky., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1975, Ser. No. 564,231
Int. Cl.² G01B 5/00
U.S. Cl. 33—143 R 2 Claims

1. A plug gauge for determining a corrected muzzle velocity for a gun barrel which fires a projectile having a rotating band thereon comprising,

a support slidably engageable with the breach of a gun barrel, said support having a cylindrical portion slightly smaller in diameter than the bore of a gun barrel to be gauged and having an annular lip adjacent said cylindrical portion larger in diameter than the bore of a gun barrel to be gauged whereby said annular lip limits the depth of insertion of said support into a gun barrel to be gauged,

a centrally located bore in said support,

a rod slidably mounted in said centrally located bore in said support,

a gauge head attached to one end of said rod, said gauge head having a front chamfer, a cylindrical portion thereon, and an outwardly extendng conical lip portion adjacent said cylindrical portion, said cylindrical portion and said conical lip portion simulating a rotating band on a projectile to be fired in said gun barrel, and

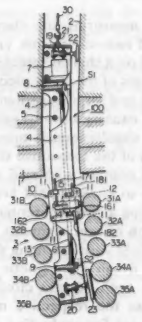
means for measuring the depth of penetration of said gauge head into the bore of a gun barrel, said depth being determined by the engagement of either the chamfer, the cylindrical portion, or the conical portion of said gauge head with the chamber wall of said gun barrel.

3,962,794

AUTOMATIC ROLL POSITION MEASURING APPARATUS FOR CONTINUOUS CASTING MACHINE

Keisuke Kima, Amagasaki, and Yasuo Sugitani, Takarazuka, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Oct. 17, 1974, Ser. No. 515,716
Claims priority, application Japan, Oct. 24, 1973, 48-123381
Int. Cl.² G01B 5/14, 7/14; B21B 31/34
U.S. Cl. 33—182 7 Claims



1. An automatic roll position measuring apparatus for use in a continuous casting machine which has a mold portion and a roller apron defining a curved guide path, said apparatus comprising:

an elongated guide slidably fitted within said mold portion and roller apron having a radius of curvature the same as the radius of curvature defined by said mold portion and said roller apron;

a truck carriage slidably mounted on said elongated guide and movable in the longitudinal direction therealong;

detector means mounted on said truck carriage and contacting said rolls of said roller apron for electrically detecting displacements of said rolls with respect to the reference positions thereof; and

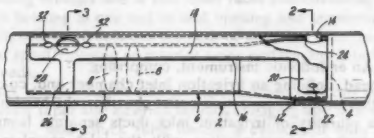
driving means operatively connected to said truck carriage for moving said truck carriage and said detector means mounted thereon in the longitudinal direction of said elongated guide.

3,962,795

ERECTOR ASSEMBLY RETAINER FOR TELESCOPIC RIFLE SIGHTS

Cecil J. Ross, El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.

Continuation-in-part of Ser. No. 566,855, April 10, 1975, abandoned. This application June 9, 1975, Ser. No. 584,798
Int. Cl.² F41G 1/38; G02B 27/36
U.S. Cl. 33—246 6 Claims



1. A telescopic sight comprising a retaining member for use in securing an erector lens assembly pivotally within a telescopic sight barrel, said retaining member being formed in one piece having an elongated bridge portion, means forming a pivot disposed at one end of said bridge portion, first integral spring means formed in one piece with, and at, said one end of said bridge portion for biasing pivot-engagement means on an erector tube into engagement with said pivot, said pivot-engagement means being operative upon engaging said pivot to hold the erector tube against longitudinal and rotational movement with respect to said retaining member while permitting pivotal movement of the erector tube with respect to the retaining member, and second integral spring means formed in one piece with and at the other end of said bridge portion for biasing the erector tube into engagement with adjusting means carried by said telescopic sight barrel.

3,962,796

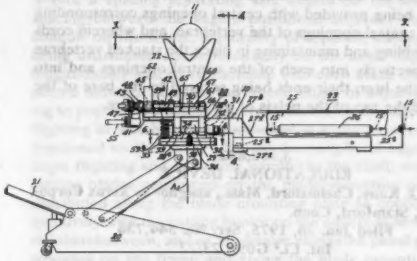
AXLE ALIGNMENT APPARATUS

Harry R. Johnston, Coatesville, Pa., assignor to American Machine Products Corporation, Coatesville, Pa.

Filed Feb. 19, 1975, Ser. No. 551,019
Int. Cl.² G01B 5/25
U.S. Cl. 33—288 4 Claims

1. An apparatus useful in aligning an axle and wheel assembly of a vehicle with respect to the frame of the vehicle, including a carriage adapted to be moved into proximity with the axle, means providing a horizontal fulcrum on said carriage, a beam mounted to pivot about said fulcrum, means carried on said beam for engaging the axle at spaced locations for disposing the beam parallel to the axle, and a source of light carried by said carriage for projecting a ray of light transversely to said beam to facilitate alignment of the axle with the vehicle frame, wherein the improvement comprises: means mounting said light source to said beam so that the ray is disposed coaxial with said fulcrum, means mounting said fulcrum for horizontal movement relative to said carriage and

axle, and means cooperating with said fulcrum mounting means and said wheel and axle assembly for centering said



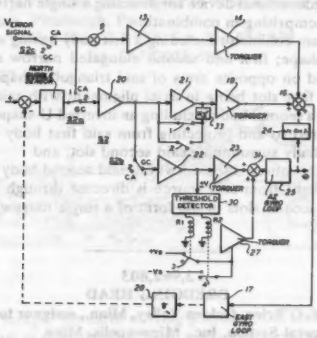
fulcrum with respect to said axle, whereby accurate axle alignment apparatus is provided.

3,962,797

SELF CONTAINED QUICK REACTING WIDE ANGLE GYROCOMPASSING

George Galuschak, Hasbrouck Heights, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Oct. 17, 1974, Ser. No. 515,598
Int. Cl.² G01C *19/38*
U.S. Cl. 33—324 10 Claims



1. In a fast reacting wide angle self-contained gyrocompassing system having an east gyro loop, an azimuth gyro loop and a north sensor means, a means for detecting the output of said sensor means requiring high rate torquing comprising:

a mode selector switch comprising a coarse align position and a gyrocompassing position,

means for detecting a threshold voltage signal from said sensor means while said switch means is in said gyrocompassing position; and

means for alternately applying signals to said east gyro loop and said azimuth gyro loop whereby said sensor means is rapidly brought to a null condition.

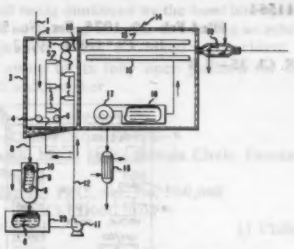
3,962,798

PROCESS FOR DRYING POROUS MATERIALS

Harold L. Jackson, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 28, 1975, Ser. No. 581,563
Int. Cl.² F26B *3/00*, *5/00*
U.S. Cl. 34—9 24 Claims

1. Process for drying water-wet porous materials, which process comprises forcing a displacement liquid through the open interstices of the water-wet porous material to remove the water, the displacement liquid consisting of a water-immiscible, normally liquid organic solvent having a surface-active agent dissolved therein, said displacement liquid having at 25°C. an interfacial tension versus water of no greater than



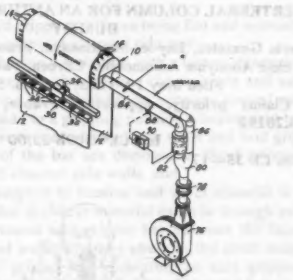
about 10 dynes cm^{-1} at 25°C., a density of at least about 1.25 grams $cm.^{-3}$ and an advancing adhesion tension versus platinum which is positive, and recovering porous material whose open interstices are substantially free of liquid water.

3,962,799

AIR BEARING MOISTURE PROFILER

Joseph A. Lapointe, Pointe Claire, and Ronald S. Sheel, Kirkland, both of Canada, assignors to Domtar Limited, Montreal, Canada

Filed Sept. 24, 1973, Ser. No. 400,155
Claims priority, application Canada, Oct. 2, 1972, 153047
Int. Cl.² F26B *21/12*
U.S. Cl. 34—54 13 Claims

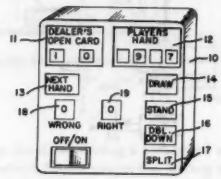


1. An air bearing dryer for drying a travelling flexible web comprising means dividing said dryer into a plurality of side by side drying sections transverse to the direction of web travel whereby each section is adapted to dry a narrow width of web passing over said dryer, each of said sections comprising an inlet chamber and an exhaust chamber in side by side relationship transverse to the direction of web travel thereby providing alternative inlet and exhaust chambers transverse to the direction of travel of said web, each of said chambers having a floor; nozzle means communicating with said inlet chambers for directing air from said inlet chambers towards said web thereby to form an air bearing, outlet passages for directing air from between said web and said dryer into said exhaust chambers, inlet duct means and exhaust duct means on the side of said floor opposite said chambers, said inlet and exhaust duct means extending across said chambers, means connecting said inlet duct means with said inlet chambers and means connecting said exhaust duct means with said exhaust chambers without interconnecting said exhaust and inlet chambers.

3,962,800
TEACHING DEVICE PARTICULARLY ADAPTED FOR THE GAME OF BLACKJACK

Robert J. Feldheim, 1441 Hemlock Ave., East Meadow, N.Y. 11554

Filed Feb. 20, 1975, Ser. No. 551,288
Int. Cl.² G09B 19/22
U.S. Cl. 35—8 B 10 Claims



1. Apparatus for teaching the card game of Blackjack or a similar game, wherein it is desired for a player to possess a hand totaling in face card values, as close to a predetermined sum as possible; comprising:

a. means for generating a first random number indicative of the total of a player's face value cards and a second number indicative of the face value of a dealer's card, and a control signal manifesting a desired one of a number of player actions,

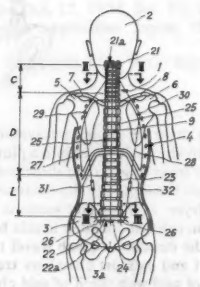
b. second means for selecting any one of said desired player actions, and

c. logic means responsive to said second means and said control signal and operative to compare said selected action with said desired one to indicate a proper or improper selection by a player using said apparatus.

3,962,801
VERTEBRAL COLUMN FOR AN ANTHROPOMORPHOUS DUMMY

Boris Gonzalez, Issy-les-Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed May 19, 1975, Ser. No. 578,384
Claims priority, application France, June 11, 1974, 74.20192
Int. Cl.² G09B 23/00
U.S. Cl. 35—17 5 Claims

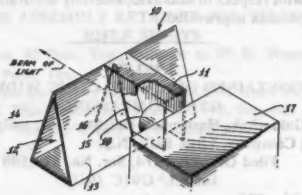


1. An anatomical and physiological structure for an anthropomorphous dummy, more particularly comprising a vertebral column constituted by a superimposition of vertebrae whose number is equal to that of the vertebrae of the human rachis, wherein each of the said vertebrae comprises a member which laterally and dorsally supports the radial processes constituting stops relative to the lateral and rearward bending movements of te column, said member is provided in its centre with an opening and has four lugs which are perforated and regularly distributed over the periphery thereof alternating with the said stops, wherein intervertebral discs made from an elastomer material are placed between each vertebra being provided with central openings corresponding with the central openings of the vertebrae, and wherein cords for assembling and maintaining in place the stacked vertebrae pass respectively into each of the central openings and into each of the lugs, their ends being secured to the base of the skull and the top of the pelvis of the said structure.

3,962,802
EDUCATIONAL DEVICE

Michael J. Kane, Chelmsford, Mass., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1975, Ser. No. 544,736
Int. Cl.² G09B 23/22
U.S. Cl. 35—19 B 3 Claims



1. An educational device for directing a single narrow beam of light comprising in combination:

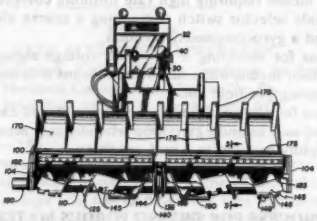
a. a beam collimator including a first body having a triangular shape; first and second elongated narrow slots disposed on opposite arms of said triangular shaped body, said first slot being in axial alignment with said second slot; a second body including an inverted U-shaped sleeve secured to and projecting from said first body and substantially surrounding said second slot; and

b. a light source disposed within said second body whereby the light from said source is directed through said first and second slots in the form of a single narrow beam of light.

3,962,803
DREDGING HEAD

Charles F. O'Brien, Golden Valley, Minn., assignor to National Car Rental System, Inc., Minneapolis, Minn.

Filed Oct. 18, 1974, Ser. No. 515,992
Int. Cl.² E02F 3/92, 3/94, 3/06; B65G 33/00
U.S. Cl. 37—66 8 Claims



1. A dredging head adapted to be carried by a boom on one end of a movable pumping dredge to loosen and remove material from the bottom of a body of water comprising: an elongated frame including means for attachment to the boom and extending transversely thereof, a suction intake conduit attached to the elongated frame to transmit material into the dredge from the dredging head, a shaft positioned on the frame and including a drive motor mounted on one end of the

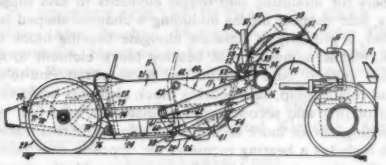
shaft for rotating the same, a pair of augers having oppositely pitched flighting mounted on the shaft for directing material toward a spacing separating said augers on the shaft, said spacing between the augers positioned adjacent the intake conduit on the frame, a plurality of separate cutting blades being distributed circumferentially on the auger flighting in longitudinally spaced relationship with each blade being connected between adjacent peripheral edges of adjacent flighting to position the blades generally normal to the extent of the flighting to which they are attached, a blade mounting plate positioned on the frame adjacent the peripheral edges of the auger flighting and extending parallel to the shaft, removable cutting blades positioned on the blade mounting plate and distributed along the blade mounting plate to cooperate respectively with the cutting blades on the augers to sever material therebetween, and an adjustable elongated panel pivotally mounted on the frame and above the blade mounting plate having a generally concave under surface overlying the extent of the flighting on the augers to direct flow of water and material around the augers and to the suction intake conduit, said panel having projecting fender members thereon to prevent entrance of large objects into the augers, said plurality of separate cutting blades on each auger flighting each having a plurality of teeth projecting from an edge of the blade and in the direction of rotation of the augers.

3,962,804

SCRAPER HAVING FORWARDLY SWINGABLE APRON AND FULL WIDTH PIVOTED STRIKER

John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 554,430
Int. Cl.² C02F *3/62*
U.S. Cl. 37—126 AA **3 Claims**



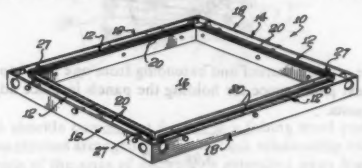
1. In a scraper for earth moving purposes, the combination comprising an open-fronted bowl including a pair of spaced vertical side sheets and a back wall as well as a floor extending between the side sheets in the rear of the bowl, ground wheels for supporting the bowl and mounted behind the rear of the bowl, ground wheels for supporting the bowl and mounted behind the back wall, a tractor-supported draft frame, a pair of draft members pivotally secured at their rear ends to the side sheets and extending forwardly and upwardly with rigid connection at their forward ends to the draft frame, actuator means coupled to the front end of the bowl for selectively supporting it at a predetermined level with respect to the draft frame, an apron having a bottom extending traversely between the side sheets in the front portion of the bowl, the apron having vertical side plates lying adjacent the side sheets and pendulously pivoted thereto, a pivoted strike-off member hinged in fixed position along the front edge of the floor and having a blade extending substantially the full width of the bowl, the strike-off member having a horizontal transport position in which it serves to enclose the bottom of the bowl and a downwardly projecting working position, actuator means for moving the apron selectively between (a) a closed position, (b) a partially open soil retaining position, and (c) a fully open position creating a large dicharge opening ahead of the floor, means including an abutment at the rear portion of the apron and an arm on the pivoted strike-off member, the arm being in the path of rearward movement of the abutment so that as the apron is swung rearwardly into closed position the blade is swung upwardly into its horizontal transport position and so that when the apron is swung from its closed position to its partially open position the blade is moved to its working position for use of the blade as a full width scraper, with the scraped soil being contained by the bowl and apron, the back wall of the bowl being movable and having an actuator for forward ejection of the contained soil incident to movement of the apron to its fully open position for use of the blade as a full width striker.

3,962,805

GRIPPING DEVICE

Kaino Johannes Hamu, 18421 Santa Belinda Circle, Fountain Valley, Calif. 92708

Filed May 22, 1975, Ser. No. 580,068
Int. Cl.² D06C *3/08*
U.S. Cl. 38—102.5 **11 Claims**



1. A gripping device for thin flexible sheet material comprising:

an elongate channel member containing a longitudinal channel of tapered cross-section opening laterally along its narrow side through one side of said member,

said channel having longitudinal side walls which converge toward the open side of said channel,

a gripper bar of substantially fixed tapered cross-section within said channel having longitudinal gripping surfaces along its opposite sides facing said channel side walls, respectively,

at least one of said gripping surfaces being flat and normally paralleling the adjacent channel side wall,

said gripper bar having a wide side with a lateral dimension exceeding the width of said open channel side and said gripper bar being movable laterally outward toward said open channel side to a gripping position wherein said bar is wedged between said channel side walls and said gripping surfaces of the bar are disposed in sheet gripping relation to said channel side walls, and

said channel is adapted to receive said sheet material in a manner such that the sheet material extends through said channel and around said gripper bar between the latter and the channel walls, whereby stress in the sheet material draws the gripper bar outwardly to said gripping position to effect gripping of the sheet material between said gripper bar surfaces and said channel side walls.

3,962,806

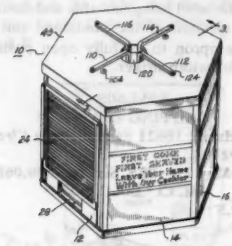
ROTATING MESSAGE DEVICE

Devon L. Eby, Nappanee, Ind., assignor to Tyme and Tydings Inc., Nappanee, Ind.

Filed Dec. 26, 1974, Ser. No. 536,417
Int. Cl.² G09F *11/23*
U.S. Cl. 40—33 **5 Claims**

1. A rotating message device comprising a horizontally positioned upper plate, a horizontally positioned lower plate spaced from said upper plate, posts interconnecting said plates and being spaced from one another around the periphery of said plates, message panels disposed in the space between said posts and being supported along the panel sides and, with the top and bottom plates, forming a rigid body with an enclosed interior space, a motor disposed in said interior space for rotating said body, a bracket attached to said upper plate for supporting said motor in said space an arm means connected to said motor and projecting upwardly therefrom through a center hole in said upper plate for connecting said device to

a plurality of spaced points on a supporting structure and thereby supporting said device in operating position, and removable, flexible strips paralleling said posts and disposed



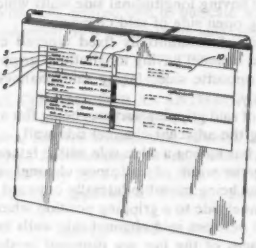
on the outside thereof and extending from one panel space to the next panel space for holding the panels in place adjacent said posts.

3,962,807

X-RAY FILM CODED IDENTIFICATION SYSTEM

Anton M. Pantone, Winnetka, Ill., assignor to CHI Systems, Inc., Evanston, Ill.

Filed Dec. 17, 1974, Ser. No. 533,486
Int. Cl.[2] G09F *11/30*
U.S. Cl. 40—78.15 6 Claims



1. A method for identifying X-rays comprising:

affixing a first series of labels to an X-ray film including a color coded portion and a symbolic coded portion representing the number of a particular visit in a series of visits;

affixing a second series of labels for affixation to an X-ray film including a color coded portion and a symbolic coded portion representing the body part or body system radiographed; and

affixing a third series of labels to physician's report of findings on an X-ray envelope including a color coded portion and a symbolic coded portion representing the number of a particular visit in a series of visits, wherein each series of labels allows the information represented therein to be readily apparent to an observor by a quick observation of the X-ray film.

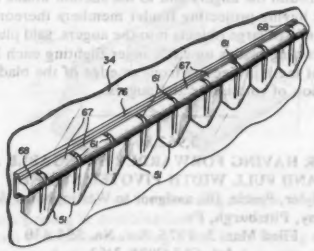
3,962,808

CHECKLIST DEVICE

Francis E. Ryder, Barrington, and Theodore H. Mueller, Cary, both of Ill., assignors to Ryder International Corporation, Barrington, Ill.

Filed Dec. 26, 1974, Ser. No. 536,304
Int. Cl.[2] G09F *11/06*
U.S. Cl. 40—104.02 10 Claims

1. A checklist device for providing an indication of tasks to be performed and tasks already completed, comprising in combination: a housing having spaced apart first and second walls, and side and bottom walls for holding said first and second walls in a fixed spaced apart relationship relative to one another, said first wall being provided by a window panel secured relative to said side and bottom walls and having a plurality of transparent discrete viewing areas provided thereon, said window panel being positioned over said second wall, but spaced therefrom to provide a receptacle for an indicia bearing sheet having indicia bearing areas formed thereon to be positioned in registry with said viewing areas, and a plurality of toggle assemblies secured to said window panel with one said assembly positioned in relation to each said viewing area, each said toggle assembly capable of being adjusted as to the number of toggle elements employed and including a plurality of toggle elements and support means for said toggle elements, which elements each include a tab portion for manual engagement and movement thereof between a first and second position, and oppositely extending mounting



members for mounting said toggle elements to said support means, said support means including a channel shaped base member, a plurality of separate elongate bearing block elements, means mounting said bearing block element to said channel shaped base member in juxtopposed end-to-end aligned relationship, said bearing block elements being comprised of first and second types of elements, said first type comprising one or more identically shaped elements, each of which includes a bearing recess at the opposite ends thereof such that the recesses of adjacent bearing block elements rotatably receive the oppositely extending mounting members of an associated toggle element, thereby adapting said toggle element for rotative movement whereby the tab portion thereof can be moved between a first and second position, said second type of elements being disposed at the respective ends of said channel shaped base member, each said second types of element having but a single bearing recess for rotatably receiving a mounting member of an associated toggle element, and serving to define the distal ends of said assembly.

3,962,809

HAND GUN HAMMER BLOCK

Joseph L. Lee, 1558 Jefferson St., Teaneck, N.J. 07666

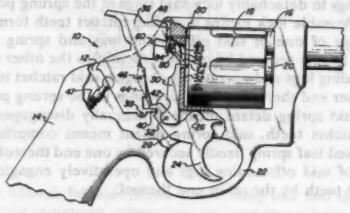
Filed Aug. 9, 1974, Ser. No. 496,176
Int. Cl.[2] F41C *17/00*
U.S. Cl. 42—66 10 Claims

1. In a fire arm having a frame, a hammer pivotally mounted in said frame, a trigger pivotally mounted in said frame below said hammer and coacting with said hammer to move said hammer from a cocked position to a firing position upon actuation of said trigger, a cartridge-receiving cylinder rotatably mounted in front of the hammer and hand means connected to said trigger and including a hand coacting with said cartridge-receiving cylinder to rotate said cylinder responsive to actuation of said trigger, the improvement of a hammer block safety apparatus to prevent unintentional movement of said hammer to said firing position and to allow said hammer to move to said firing position in response to actuation of said trigger, comprising:

a blocking member;

means journalling said blocking member for pivotal movement about a given axis of rotation into and out of said path of travel of said hammer adjacent to said path of travel from said cocked position to said firing position;

means biasing said blocking member to pivotally rotate into said path of travel;



means positioning said blocking member in said path of travel; and

said hand means operatively connected to said trigger to contact said blocking member and pivotally rotate said blocking member out of said path of travel of said hammer upon actuation of said trigger for moving said hammer from said cocked position to said firing position.

3,962,810

STOPPER FOR USE IN TRAWLING GEAR

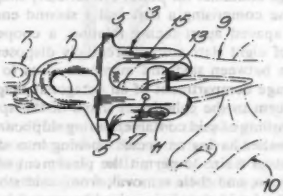
Anthony Alan Buschini, Fleetwood, and Douglas Edward Swarsbrick, Stourport-on-Severn, both of England, assignors to Parsons Controls Limited, Stourport-on-Severn, England

Filed Aug. 19, 1974, Ser. No. 498,766

Claims priority, application United Kingdom, Aug. 24, 1973, 40207/73

Int. Cl.² A01K *73/02*

U.S. Cl. 43—8 **5 Claims**



1. A stopper component for use in a fishing trawl, the component including a ring-like part at one end of generally chain link form and two spaced arms at the other end of the component forming a clevis and being joined to said ring-like part, said clevis merging with one end of said ring-like part, and shoulders respectively projecting outwardly from the sides of the component at the location where said clevis joins the ring-like part, said shoulders projecting laterally outwardly beyond said arms and laterally outwardly beyond said ring-like member, said arms being formed with aligned apertures; and a connecting pin extending between said apertures and into said apertures.

3,962,811

CHAIN COMPONENT

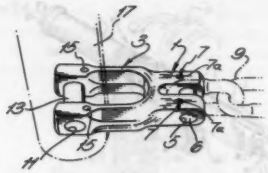
Anthony Alan Buschini, Fleetwood, and Douglas Edward Swarsbrick, Stourport-on-Severn, both of England, assignors to Parsons Controls Limited, Stourport-on-Severn, England

Filed Aug. 19, 1974, Ser. No. 498,780

Claims priority, application United Kingdom, Aug. 24, 1973, 40209/73

Int. Cl.² A01K *73/02*

U.S. Cl. 43—8 **2 Claims**



1. A shackle component for use in a fishing trawl comprising two clevises arranged in back-to-back relationship with the free ends of the arms of each clevis extending away from the free ends of the arms of the other clevis, the arms of one of said clevises being longer than the arms of the other of said clevises and said one of said clevises being wider than said other of said clevises, both of said clevises lying in the same plane, aligned main apertures of oval shape being formed in the arms of each clevis and other apertures being formed in at least one of the arms of each clevis to extend transversely to and intersect the main aperture in the associated arm, oval connecting pins respectively in the main apertures in each of said clevises and spanning the space between the associated clevis arms, each of said connecting pins having a tangential groove in the part thereof located within one of said main apertures, and locking pins respectively in said other apertures engaging the tangential grooves in said connecting pins in the respectively associated main apertures.

3,962,812

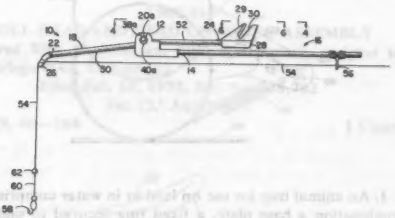
SIGNALING DEVICE FOR A FISHING ROD

Donald J. Means, 3284 Piney Ridge Road, Rte. No. 3, Ludington, Mich. 49431, and John R. Conlin, Jr., Rte. No. 1, Eau Claire, Mich. 49111

Filed Apr. 3, 1975, Ser. No. 564,699

Int. Cl.² A01K *97/12*

U.S. Cl. 43—17 **9 Claims**



1. A signaling device for use on a fishing rod having a reel end and a tip end, said device comprising: an adapter member having means for connection to said rod tip end; and a generally straight, elongated, balance beam member having opposite ends, said beam member having a line guide element on one end thereof, and means including a fin element on the other end thereof for retainably receiving shot weights, said beam member being pivotally mounted intermediate said ends thereof on said adapter member for movement between a

normal position with said beam member generally parallel with said rod and with said line guide element spaced outwardly from said tip end of said rod, and a signaling position at an angle with respect to said rod.

3,962,813

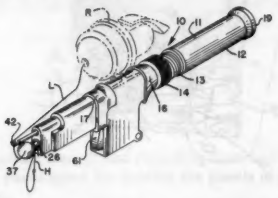
TARGET FISHING ROD

Paul G. Moon, 9614 Dona Court, Crown Point, Ind. 46307

Filed May 19, 1975, Ser. No. 578,719

Int. Cl.² A01K *91/02*

U.S. Cl. 43—19 **5 Claims**



1. A fishing rod comprising a grip means for mounting a fishing line reel thereon, a float sub-assembly for releasably retaining a fishing line, said float assembly comprising a float and a float carrier, means mounting said float on said float carrier for movement between a fish hook clamping position and a hook released position, bore means housing said float sub-assembly in one end of said grip, means for propelling said float sub-assembly from said bore toward a fishing target area, and trigger means for retaining said float sub-assembly in said bore against the force of said propelling means, and for releasing said float sub-assembly for propelling movement toward a target area.

3,962,814

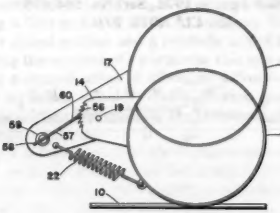
HUMANE TRAP

Henry William Steiner, Box 18, Site 19, R.R. No. 1, Dryden, Ontario, Canada

Continuation-in-part of Ser. No. 368,720, June 11, 1973, Pat. No. 3,835,576. This application Aug. 30, 1974, Ser. No. 502,175

Int. Cl.² A01M *23/26*

U.S. Cl. 43—86 **2 Claims**



1. An animal trap for use on land or in water comprising in combination a base plate, a fixed ring secured to said base plate by the lower side thereof and extending upwardly therefrom to lie in a substantially vertical plane when in use, a movable ring pivotally secured for swinging movement by one side thereof to one side of said fixed ring, said rings being situated in parallel planes and substantially in juxtaposition one with the other, tension spring means operatively connected between said rings normally urging said movable ring out of concentric relationship with said fixed ring and in the sprung position, trigger means operatively connected between said rings to hold said movable ring substantially in concentric relationship with said fixed ring and in the set position, an offstanding lug secured to said fixed ring and extending outwardly therefrom in the same plane as said fixed ring, and an offstanding lug secured to said movable ring and extending outwardly therefrom in the same plane as said movable ring, pivot means securing said lugs together, said lug on said movable ring having an extension beyond said pivot means, spring anchor means on said fixed ring, said tension spring being operatively secured between said spring anchor means and said extension beyond said pivot means, by the ends thereof, and releasable lock means operatively connected between said rings to detachably lock said rings in the sprung position, said releasable lock means including ratchet teeth formed on the edge of one of said offstanding lugs and spring detent means fixedly secured by one end thereof to the other of said offstanding lugs and operatively engaging said ratchet teeth by the other end thereof to hold said rings in the sprung position until said spring detent means is manually disengaged from said ratchet teeth, said spring detent means comprising an elongated leaf spring fixedly secured by one end thereof to the other of said offstanding lugs and operatively engaging said ratchet teeth by the other end thereof.

3,962,815

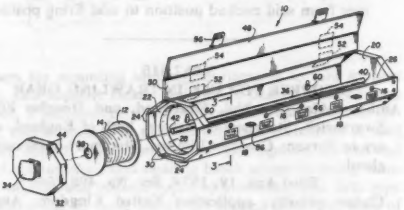
STORAGE CONTAINER FOR SPOOLS OF FISHING LINE

Peter Christensen, 460 Sandhill Road, Wantagh, N.Y. 11793

Filed Feb. 7, 1975, Ser. No. 547,802

Int. Cl.² A01K *97/00*

U.S. Cl. 43—54.5 R **1 Claim**



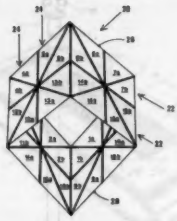
1. A storage container for plural cylindrically shaped spools of fishing line comprising a first and a second end member disposed in spaced apart facing relation, a cooperating arrangement of eight slats circumferentially disposed in spanning relation between said end members so as to bound an internal storage compartment of an octagonal shape so as to closely conform to the cylindrical shape of the spools while minimizing rolling of said container during shipboard use, said first end member having an access opening into said storage compartment of a size to permit the placement of spools of fishing line into, and their removal, from, said storage compartment, all of said slats being sized to extend beyond said first end member so as to form an octagonal-shaped closure-gripping lip about said access opening, a closure member adapted to be force fit within said lip in its closed position over said access opening, an adjacent pair of said slats being hinged to each other and also hinged for opening and closing movements relative to the other slats so as to provide a second access opening into said storage compartment, a spool-supporting axle connected in a central location across said storage compartment in spanning relation between said closure member and said second end member by having its opposite ends projected into openings in said closure member and said second end member, and dispensing openings at spaced locations in one said slat for unwinding select lengths of fishing line from supply spools thereof supported on said axle within said storage compartment.

3,962,816

FOLDABLE STRUCTURE

Iris Sarid, 27 Tiberias Str., Jerusalem, Israel

Filed Nov. 26, 1974, Ser. No. 527,278
Int. Cl.² A63H 33/16
U.S. Cl. 46—1 R 2 Claims



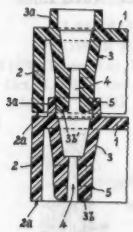
1. A closed, foldable blank for forming two and three dimensional structures, comprising at least three large square faces, each face being connected to two adjacent faces by transverse fold lines, and each face having a third transverse fold line bisecting said face, a further fold line perpendicular to said transverse fold lines at the midpoints thereof, thereby dividing each face into four small squares, and two diagonal fold lines connecting the corners of each face thereby dividing each small square into two triangles.

3,962,817

TOY CONSTRUCTION ELEMENT

Paul Roland Vullierme, 2, rue de la Plaine, Rumilly, France

Filed Jan. 22, 1975, Ser. No. 542,934
Int. Cl.² A63H 33/08
U.S. Cl. 46—25 4 Claims



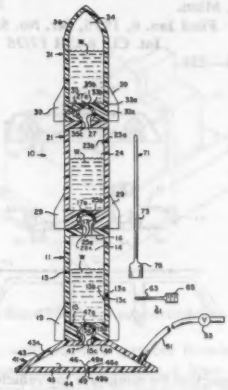
1. A construction block comprising a generally planar wall having a pair of faces, an apron on the periphery of said wall extending from one of the faces thereof and having an outer edge defining a plane, and a plurality of tubes extending through and secured to said wall, each tube having one end of predetermined inner diameter projecting through said wall beyond the other face thereof and another end lying generally at said plane and having an outer diameter corresponding generally to said inner diameter, whereby two such blocks can be fitted together by engaging said other ends of at least some of said tubes of one block in the one end of at least some of the tubes of the other block with the apron of the one block resting on the wall of the other block, each tube being adapted to penetrate at its said other end the said one end of a tube of the other block to a predetermined length of the said other end, said other ends of said tubes being cleft and having along said length a diameter slightly greater than said inner diameter, each of said other ends having an outer region terminating at said plane and of a diameter substantially equal to said inner diameter, an inner region between said outer region and said wall of a diameter slightly greater than said inner diameter, and a shoulder between said regions.

3,962,818

REACTION TOY ARRANGEMENT AND METHOD

Reginald F. Pippin, Jr., 7806 Ruxway Road, Towson, Md. 21204

Division of Ser. No. 102,294, Dec. 29, 1970, Pat. No. 3,683,544, which is a division of Ser. No. 504,300, Oct. 24, 1965, Pat. No. 3,550,313. This application June 22, 1972, Ser. No. 265,283
Int. Cl.² A63H 27/100
U.S. Cl. 46—74 D 43 Claims



1. A jet-propelled toy comprising
a plurality of individual interconnectable separable units,
one of said units having a pressurizable fluid storage chamber and a directionally stable jet propulsion fluid expulsion orifice in fluid connection between said storage chamber and the atmosphere,
and a normally self-closed, fluid-pressure-containing, fluid passage valve in the body of said one unit at other than said fluid expulsion orifice for fluid passage connection between said pressurizable fluid storage chamber and a zone exterior of said one unit when said normally self-closed valve is opened.

3,962,819

DOLL HEAD AND HEAD COVERING ASSEMBLY

Godtfred Kirk Christiansen, Billund, Denmark, assignor to Interlego A.G., Switzerland

Filed Feb. 10, 1975, Ser. No. 548,792
Int. Cl.² A63H 3/36
U.S. Cl. 46—164 1 Claim

1. A combined doll's head and head gear assembly mounted thereon,

said head being substantially spherical with a projection from the top thereof,

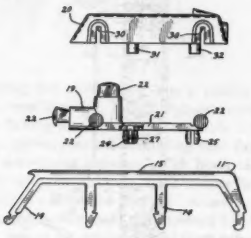
said head gear being adapted to cover the top of said head, the interior of said head gear defining an arcuate groove of a width about equal to the transverse dimension of said projection and adapted to receive said projection, so that said gear may move in a limited guided path over the top of the head, whereby said head gear is movable into a plurality of positions over the top of said head.

3,962,820

CONNECTION FOR MINIATURE TOY VEHICLE PARTS

Thomas W. Good, Minnetonka, and Bernard J. Dehner, Mound, both of Minn., assignors to Tonka Corporation, Hopkins, Minn.

Filed Jan. 6, 1975, Ser. No. 538,679
Int. Cl.² A63H 17/26
U.S. Cl. 46—221 **3 Claims**



1. A connection for miniature toy vehicle parts comprising,

a. a first toy vehicle component of rigid sheet material having an aperture therein,

b. a second toy vehicle component of molded resilient plastic material,

c. said second component having an expansion collar molded integrally therewith and extending outwardly therefrom formed of two or more arcuate segments arranged in spaced relation about a center axis,

d. said expansion collar having a greater external diameter than said aperture but the segments being relatively contractible to allow the collar to be forced through the aperture and then return to its normal condition, and

e. a third toy vehicle component including a post inserted axially into the collar to prohibit contraction of the segments.

3,962,821

POLLEN DISPENSING APPARATUS

David E. Sharp, Rte. 104, Ji-Meva Farms, North Rose, N.Y. 14516

Filed July 24, 1975, Ser. No. 598,717
Int. Cl.² A01G 7/00
U.S. Cl. 47—1.41 **5 Claims**

1. Apparatus for dispensing plant pollen to be carried through the air to plants in the vicinity of the apparatus, the latter comprising:

a. a resilient, elongated support member having a base end and a free end;

b. a container having a wall with perforations therein through which pollen may be dispensed and affixed to said support member adjacent said free end; and

c. elongated handle means to which said support member is attached at said base end thereof, said handle means including a manually engagable portion extending from said base end away from said free end and a rigid portion extending in closely spaced relation to said support member from said base end toward said free end to the region of said container, whereby manipulation of said manually engagable portion causes flexure of said support member away from said rigid portion and return movement of said free end to strike said rigid portion with percussive effect to shake pollen from said container.

3,962,822

PLANTING CONTAINERS

John Walters, Whonnock, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 31, 1975, Ser. No. 563,854
Claims priority, application Canada, Apr. 8, 1974, 196996
Int. Cl.² A01G 23/00
U.S. Cl. 47—34.11 **13 Claims**

1. A planting container for grouping with a plurality of similar containers into a bundle, said containers comprising:

a. a tubular portion having a square shaped outer cross-section defining four walls and a cavity;

b. a plurality of the walls having a plurality of longitudinally spaced apertures, said apertures being offset to one side of the longitudinal center of each wall whereby the apertures are blocked by a wall of another similar container which is placed contiguous thereto; and

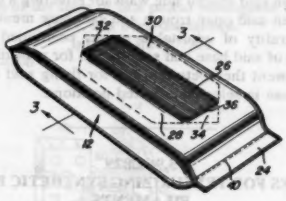
c. an earth penetrating nose portion having at least one surface portion which defines the bottom of said cavity, said surface portion sloping downwardly and outwardly to the lowest of said apertures in a corresponding wall to allow unimpeded tap root egress.

3,962,823

PLANTING BAG

John O. Zipperer, III, P.O. Box 640 Peck at Broadway, Fort Myers, Fla. 33301

Filed Dec. 30, 1974, Ser. No. 537,415
Int. Cl.² A01C 11/02; A01G 9/02; B65D 85/50, 65/28
U.S. Cl. 47—37 6 Claims



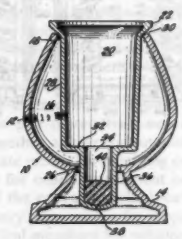
1. A planting bag, comprising, in combination:
a. a sealed bag forming a closed container, said bag constructed from a flexible, non-self-supporting material;
b. indicia means provided on the bag for facilitating the formation of a single large rectangular opening in the bag of more than one-half the size of the bag by cutting along the indicia means, said indicia delineating flaps formed when the bag is cut when forming the opening, said flaps being foldable inwardly into underlying relation to the adjacent portion of the bag to define a lip around the opening; and
c. means provided for positioning around the central portion of the bag for retaining the bag in a predetermined shape once the opening is made therein and to prevent deformation of the bag when liquids are added thereto through said opening, comprising; an endless member, severable from the bag and constructed from the same material as the bag for positioning around the central portion of the bag.

3,962,824

FLOWER POT

James T. Poston, 8109 Clover Way, Buena Park, Calif. 90620

Filed Oct. 4, 1974, Ser. No. 511,949
Int. Cl.² A01G 27/00
U.S. Cl. 47—38.1 5 Claims



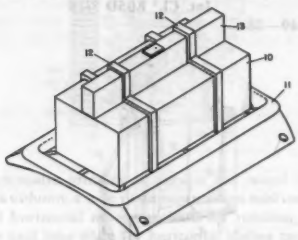
1. A flower pot comprising a water container having a closed base portion and an open upper portion separated by an inwardly directed collar portion, a soil-containing chamber removably received within said container, said chamber having an upper outwardly directed annular collar portion extending over and resting on the upper end of said container, said chamber having an imperforate, substantially cylindrical upper portion and a lower portion of decreased diameter extending through said container collar portion and having an opening therein at the lower portion thereof, a resilient porous plug of greater diameter than said lower portion, received therein, and located directly over said opening, the diameters of said container and chamber upper portions being in a ratio of approximately 2-1 respectively, whereby said container upper portion is adapted to hold a substantial amount of water in addition to that contained in said base portion, which water is wicked through said plug into said soil at a controlled rate for extended periods of time.

3,962,825

HOLDER FOR SUPPORTING FLOWER ARRANGEMENTS

Donald L. O'Connell, Portchester, N.Y., assignor to Floral Innovations, Inc., Port Chester, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,123
Int. Cl.² A01G 5/04
U.S. Cl. 47—41.12 9 Claims



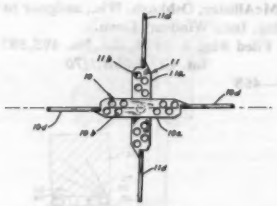
1. A holder for a foam block for supporting flower arrangements comprising:
a hollow double-wall, tray-like member forming a water-confining receptacle for supporting a foam block, the upper wall of said receptacle having at least one aperture for draining excess water from the foam block into the receptacle;
and means for retaining the foam block in a desired position on said member.

3,962,826

COLLAPSIBLE FLOWER STEM HOLDER

Loren C. Kienlen, and Jack H. Poppler, both of Nisswa, Minn., assignors to Doormaid, Inc., Nisswa, Minn.

Filed Aug. 23, 1974, Ser. No. 500,152
Int. Cl.² A01G 5/04; A45F 5/08; A47G 29/00
U.S. Cl. 47—41.13 3 Claims



1. A holder for flower stems particularly designed for use in combination with a narrow mouth vase and comprising
a pair of elongated arms each having a flat horizontally oriented central portion provided with stem receiving openings therethrough,
a pair of generally flat downwardly extending supporting elements respectively provided at the end portions of said arms and disposed at generally right angles to said central horizontally oriented arm portions,
pivot means connecting the central portions together to permit said arms to be collapsed with the flat supporting

elements disposed in compact face-to-face relation to permit insertion into a narrow mouth vase when in collapsed position,

said supporting elements engaging the bottom of the vase to elevate said apertured center portions of the arms above the bottom of the vase when said arms are expanded into operative position within said vase,

the ends of said arms engaging the side walls of the vase to limit lateral movement of the expanded holder when positioned in the vase bottom.

3,962,827

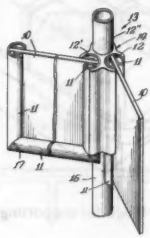
PANEL CONNECTOR

William H. Chaffee, Chicago, Ill., assignor to Model Builders, Inc., Chicago, Ill.

Filed June 18, 1975, Ser. No. 588,068

Int. Cl.[2] E05D 5/16

U.S. Cl. 49—384 14 Claims



1. In a panel mounting system wherein a panel edge is mounted to a support defining a segmentally cylindrical socket, an improved connector for connecting the panel edge adjustably to said support comprising

a spring clip defining a pair of opposed leg portions and an interconnecting bight portion defining a panel edge receiving space, each of said leg portions defining an inturned, substantially rectilinear distal end having a length at least approximately one-half the dimension of said clip outwardly from an innermost portion of said bight for effectively gripping opposite sides of the panel edge therebetween.

3,962,828

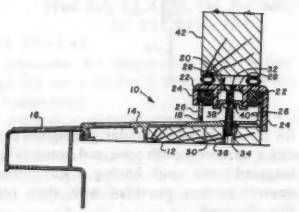
ADJUSTABLE FRAMING MEMBER

Owen Earl McAllister, Oshkosh, Wis., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 1, 1974, Ser. No. 493,597

Int. Cl.[2] E06B 1/70

U.S. Cl. 49—468 4 Claims



1. An adjustable wall penetration framing member for de-

wherein the wall penetration member comprising:

a. an elongated open trough having spaced sidewalls on each side thereof, said open trough having inner and outer sides and said open trough having its outer side facing said opening of said wall penetration;

b. an elongated base comprising an open channel having relatively spaced side walls on each side thereof, said open channel having its open side facing said open trough and said open channel being adapted to slidingly fit into said open trough;

c. means positioned on said inner side of said open trough between said spaced side walls for effecting a weatherseal between said open trough and said base member; and

d. a plurality of adjustable means positioned along the length of said base and said trough for providing relative adjustment therebetween and for fixing said trough and said base in selected adjusted positions.

3,962,829

MACHINES FOR TEXTURIZING SYNTHETIC POLYMER FILAMENTS

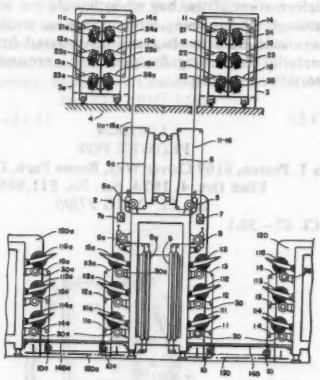
Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Oct. 15, 1974, Ser. No. 514,470

Claims priority, application Germany, Oct. 17, 1973, 2352027

Int. Cl.[2] D01H 13/28

U.S. Cl. 57—34 HS 10 Claims



1. A textile machine for texturizing synthetic polymer filaments which comprises a first set of filament-delivery rollers, a second set of filament-delivery rollers, filament heating means and filament texturizing means in the filament path between said sets of rollers, first, second and third substantially parallel machine frame parts in horizontally spaced relationship, a plurality of filament take-up units for the bobbin-winding of the texturizing filaments arranged in sets on each of the three frame parts, said first frame part having mounted thereon said texturizing means, and said second and third frame parts having their respective take-up units opposite to and horizontally spaced from the take-up units on said first frame part.

3,962,830
MACHINING STRUCTURE

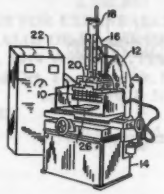
Thomas J. O'Connor, 100 Morgan Road, Ann Arbor, Mich. 48106

Continuation-in-part of Ser. No. 68,711, Sept. 1, 1970, abandoned, which is a division of Ser. No. 545,652, April 27, 1966, Pat. No. 3,663,786. This application Dec. 3, 1973, Ser. No. 420,808

The portion of the term of this patent subsequent to May 16, 1989, has been disclaimed.

Int. Cl.[2] B24B 7/00

U.S. Cl. 51—58 2 Claims



1. Structure for mechanically producing a desired form in a workpiece of friable material such as carbon or the like comprising a cutting master having a mirror image surface thereon of the form to be produced in the workpiece which is different in size from the form to be produced which surface is abrasive, means for supporting the cutting master, means for supporting the workpiece adjacent to the cutting master and in alignment with the abrasive mirror image surface thereon, means for moving the aligned cutting master and the workpiece with respect to each other toward and into contact with each other under pressure sufficient to cause abrasion of the workpiece by the abrasive mirror image surface on the cutting master on additional relative movement between the cutting master and the workpiece at least part of which additional movement is in a plane which does not include the direction of movement of the cutting master toward the workpiece, means included in at least one of the means for supporting the cutting master and workpiece for imparting an additional repetitive relative movement between the cutting master and workpiece for abrading the workpiece into the different size form to be produced in conjunction with the movement of the cutting master and workpiece toward each other, at least part of which additional relative movement is in a plane which does not include the direction of movement of the abrasive mirror image surface of the cutting master toward the workpiece, including at least one pair of relatively eccentric cylindrical members secured together axially for rotation together, first relatively movable plate means for receiving one of the pair of cylindrical members for orbital movement of the first plate means on rotation of the eccentric cylindrical members, second relatively stationary plate means for supporting the other of the pair of cylindrical members for rotation about the axis of the other of the pair of cylindrical members whereby the first plate means is moved in an orbital motion about the axis of the other of the pair of cylindrical members, in which structure the cutting master mirror image surface is different in size from the form to be produced by an amount related only to the additional relative movement imparted between the cutting master and workpiece in the plane not including the direction of movement of the cutting master toward the workpiece, and means for flushing a solvent fluid through the cutting master between the cutting master and workpiece while the workpiece is abraded into the form to be produced in the absence of electrical machining between the cutting master and workpiece.

3,962,831
AUTOMATIC GRINDING METHOD AND APPARATUS FOR WOOD WORKING

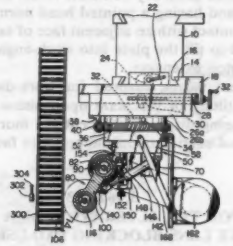
Akira Miki, Fujimi, Japan, assignor to Sanko Mokkoki Co., Ltd. and Western Trading Co., Ltd., both of Tokyo, Japan

Filed May 22, 1975, Ser. No. 580,070

Claims priority, application Japan, May 30, 1974, 49-60252

Int. Cl.[2] B24B 7/00

U.S. Cl. 51—78 9 Claims



1. An automatic grinding apparatus for wood working, comprising a column; a base plate mounted on said column for vertical and horizontal movement and for rotation; a slider mounted on said base plate for horizontal sliding movement; a means for swinging a grinding wheel, said means including a swing arm pivotally connected at one end to said slider and carrying at the other free end a grinding wheel shaft, and a means for swinging said swing arm toward and away from a material to be ground; and a grinding wheel compensating means including a means for detecting angular displacement of the swing arm above the range of the predetermined angle due to abrasion of the grinding wheel and a means for advancing the slider toward the material the wearing distance of the grinding wheel until the swing arm restores to its initial angular position.

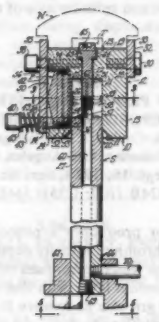
3,962,832
FLUID RESPONSIVE, LEVERAGE OPERATED CHUCK

Ray Howard Strasbaugh, Long Beach, Calif., assignor to R. Howard Strasbaugh, Inc., Long Beach, Calif.

Filed Aug. 26, 1974, Ser. No. 500,530

Int. Cl.[2] B24B 41/06

U.S. Cl. 51—217 L 6 Claims



1. A fluid actuated chuck comprising in combination:
a work support member having work-engaging jaws disposed at opposite sides thereof, which jaws are adapted jointly to hold a workpiece which is located upon the support member, at least one of which jaws is selectively longitudinally tiltable toward and away from the other

along a fulcrum line located closely adjacent said workpiece;

said tiltable jaw comprising an apertured plate loosely carried on short outward projecting lengths of four shafts which traverse respective apertures thereof in a generally quadrangular pattern and are terminally anchored in a side of the chuck, which pattern is spaced from said workpiece with two sides of the quadrangle disposed generally parallel thereto;

a fluid responsive piston transversely carried by said chuck, with its axis generally centered within said quadrangular pattern and having a pointed head normally disposed in apical contact with an adjacent face of said plate and thus disposed to tilt the plate into work-engagement position upon piston extension;

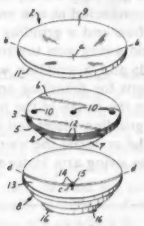
and resilient means adapted for work-disengagement by reverse tilting of the plate upon piston retraction, said means being disposed adjacent the more distant pair of shafts and bearing upon the opposite face of said plate.

3,962,833

METHOD FOR THE ALTERATION OF A LENS AND AN ADHESIVE LENS BLOCKING PAD USED THEREIN

Dee Lynn Johnson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1975, Ser. No. 563,389
Int. Cl.² B24B *13/00*
U.S. Cl. 51—284 **26 Claims**



19. A lens adhesive blocking pad comprising a conformable substrate having a pressure sensitive adhesive applied to the planar surfaces thereof and having means for accurately aligning the center point and cylinder axis of a lens with the center point of a lens block.

3,962,834

METHOD OF PRODUCING A PITTED, POROUS ELECTRODEPOSITED CHROMIUM COATING

William F. Ostarch, Covina, Calif., assignor to Van Der Horst Corporation of America, Los Angeles, Calif.

Filed Sept. 16, 1974, Ser. No. 506,385
Int. Cl.² B24B *1/00;* **C25D** *5/48;* **C25F** *3/02*
U.S. Cl. 51—323 **1 Claim**

1. A method for producing a pitted porous layer of an electrodeposited chromium initially deposited in excess of the final layer thickness which comprises the steps of:

honing said chromium layer with fine diamond grit of from about 40–100 grit size to remove from about 55–80% of the total chromium to be removed and to allow for subsequent D.C. reverse and final hone to said final layer thickness;

D.C. reverse etching at a specific a.m.s.i. said honed surface; and

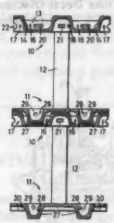
honing said etched surface with an abrasive grit stone of a hardness in the range of I-M and of a grit size in the range of 100–300 to a final dimension, wherein the surface is pitted and wettable, and the pits are nonconnected.

3,962,835

BUILDING UNIT

Philip Andrew Little, 235 Brunswick St., Fortitude Valley, 4004 Australia

Filed July 25, 1974, Ser. No. 491,858
Claims priority, application Australia, July 25, 1973, 4229/73; May 8, 1974, 7502/74
Int. Cl.² E04B *1/34, 1/348*
U.S. Cl. 52—73 **3 Claims**



1. A building unit including:

a. a substantially rectangular roof section shaped to form longitudinal corrugations between transverse beams at its ends, said transverse beams being intergrally formed with said longitudinal corrugations, said corrugations comprising upwardly extending hollow longitudinal ribs defining channels between them,

b. a substantially rectangular floor section shaped to form longitudinal corrugations between transverse beams at its ends, said transverse beams being integrally formed with said longitudinal corrugations, said corrugations defining downwardly extending channels, and

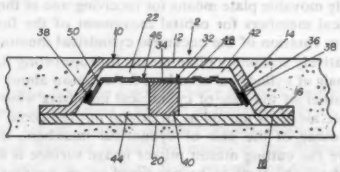
c. supporting means rigidly interconnecting the roof section and the floor section in spaced substantially parallel arrangement, said supporting means comprising a pair of columns each connected at its ends only to the middle parts of said transverse beams of said roof and floor sections, the parts being so made and arranged that when the unit is superimposed on a similar unit the floor section beams of the upper unit bear on the roof section beams of the lower unit and the floor section channels of the upper unit extend into the roof section channels of the lower unit.

3,962,836

GRAVE MARKER

Stephen E. Carnes, 1147 Kimberly Drive, Yuba City, Calif. 95991, and Robert M. Carnes, 2406 Buchanan St., Marysville, Calif. 95901

Filed Apr. 28, 1975, Ser. No. 572,572
Int. Cl.² E04H *13/00*
U.S. Cl. 52—104 **18 Claims**



1. A grave marker comprising a cover constructed of a transparent plastic material inert to the atmosphere and to ultraviolet light, the cover being defined by a center portion and a continuous side extending transversely from the center portion to form a hollow interior space within the cover, the side sloping away from the center portion whereby the marker can be mechanically locked in a concrete panel by pouring the

panel over the cover side; a base sealingly secured to ends of the sides to hermetically seal the space from the atmosphere; means disposed in the space and spaced apart from the center portion of the cover and defining an inscription for the marker; and a coloring agent visible through the center portion and applied to the inscription defining means and interior marker surfaces spaced from the cover whereby the coloring agent and the inscription defining means are protected from damage caused by atmospheric conditions and ultraviolet light.

3,962,837

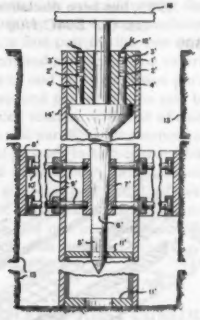
APPARATUS FOR EXPANDABLY ENGAGING THE WALLS OF AN EARTHEN HOLE

Samuel J. Sero, 5614 Walnut St., Pittsburgh, Pa. 15232

Filed Oct. 11, 1974, Ser. No. 514,091

Int. Cl.² F02D *5/74*

U.S. Cl. 52—158 **11 Claims**



1. An apparatus for expandably engaging the walls of an earthen hole in order to resist movement urged by an external force, comprising:

a. a head containing a chamber;

b. an explosive charge insertable into the chamber of said head and engageable therein;

c. means for detonating said explosive charge;

d. a guide frame attached to said head;

e. a piston slidably disposed within at least a part of the chamber of said head;

f. a rod connected to said piston, a portion of said rod being tapered in shape the largest cross-sectional area of which is located nearest the part of said rod connected to said piston;

g. means for connecting said piston to said rod;

h. means for engaging said rod with the external force;

i. a plurality of radially movable tapered segmental wedges slidably engageable with the tapered portion of said rod;

j. a plurality of cylindrical segmental bearing plates spaced from the wedges and adapted to be moved from a first closed position in which they form a substantially cylindrical wall to a second radially extended position in which they are circumferentially spaced apart; and

k. means for operably connecting each of said bearing plates to said segmental wedges, slidably through said guide frame, whereby when said charge is detonated the rod and piston act on the wedges to radially move the bearing plates to engage the earthen hole wall.

3,962,838

SHELF-ADJUSTING STAIR

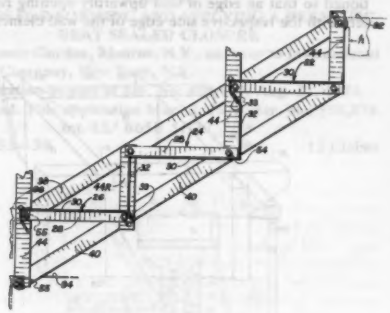
Joe Warren Cox, 504 Rancho Road, Thousand Oaks, Calif. 91360

Filed Mar. 14, 1975, Ser. No. 558,485

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.² E04F *11/00, 19/00*

U.S. Cl. 52—183 **15 Claims**



1. A self-adjusting stair framework formed of a plurality of interconnected linkage members, said framework comprising:

a plurality of treads positionable in a substantially horizontal relationship, each of said treads having a front side and a rear side and a pair of lateral sides, each of said treads supported by a pair of tread carriers, a said tread carrier located at each said lateral side of each of said treads;

a pair of upper stringers, each said upper stringer pivotally connected to said tread carriers;

a pair of lower stringers, each said lower stringer pivotally connected to said tread carriers;

a vertical tread spacer located between and pivotally connected to each adjacent pair of said treads; and

at least one longitudinal slot means formed within one of said linkage members, said slot means located at the pivotal interconnection between a pair of said members, said slot means being inclined with respect to the longitudinal axis of the said member which contains said slot, said slot means permitting an adjusting movement of said framework between a minimum rise adjustment position and a maximum rise adjustment position, said maximum adjustment position being displaced horizontally and vertically from said minimum adjustment position throughout the adjusting movement, the direction of said inclined slot means substantially coinciding with the direction of said adjusting movement,

means interconnecting a said stringer and a said tread spacer and a said tread carrier, said means passing through said slot means, said means being movable within said slot means during said adjusting movement.

3,962,839

STRUCTURAL WALL ELEMENT, ESPECIALLY LOAD BEARING WALL ELEMENT

Gustav Ickes, Karlsbader Str. 1a, 6462 Gelnhausen-Hailer, Germany

Filed July 24, 1974, Ser. No. 491,490

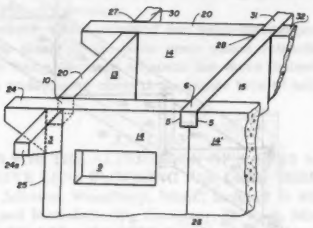
Claims priority, application Germany, July 28, 1973, 2338390

Int. Cl.² E04C *2/00;* **E04B** *2/74*

U.S. Cl. 52—262 **1 Claim**

1. In a prefabricated building structure comprising four vertical load bearing wall elements, each having a top edge, a bottom edge, and two side edges, joints between adjacent wall elements, each wall element having a height substantially

equal to the height of a story of said building structure, the improvement wherein each of said four wall elements comprises two cantilevers, each cantilever extending from a top corner and from the respective side edge in the plane of the respective wall element, each cantilever having an upper edge extending level with the top edge of the corresponding wall element to form a common top edge, and a lower edge extending above the bottom edge of the corresponding wall element, two of said wall elements having an upwardly opening recess in said common top edge adjacent to each cantilever positioned so that an edge of said upwardly opening recess registers with the respective side edge of the wall element, each of



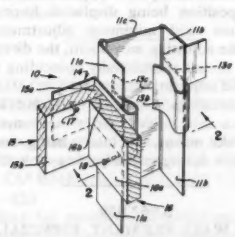
the remaining two wall elements having a downwardly opening recess in the lower edge of each of its cantilevers adjacent to the respective side edge thereof to which the respective cantilever is joined so that an edge of said downwardly opening recess registers with the adjacent side edge, said recesses having widths substantially equal to the widths of said wall elements and depths substantially equal to one half the height of said cantilevers at the respective side edges of said wall elements, said joints being formed by the interlocking between an upwardly opening recess and a downwardly opening recess, whereby two interlocking cantilevers extend from each corner of the structure to form a ring beam.

3,962,840

CORNER CONSTRUCTION AND CLIP THEREFOR

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Mar. 22, 1973, Ser. No. 343,659
Int. Cl.[2] E04B 1/00
U.S. Cl. 52—281 **8 Claims**



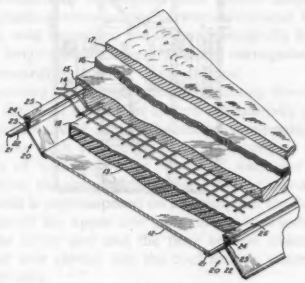
1. An interior corner construction comprising an elongated metallic supporting flange having an inner surface and an outer surface; a first panel having a broad surface with a portion of the outer surface thereof in proximate side-by-side relation with the outer surface of said flange; a second panel angularly disposed relative to said first panel, one of said panels having a narrow edge thereof in abutting relation with an exposed surface of the other panel, said supporting flange being positioned external of the angle included between said first and second panels; a clip resiliently mounted on said supporting flange and in contact with said first and second panels; said clip including a first portion in resilient gripping relation with the inner and outer surfaces of said flange, a first segment of said clip first portion being sandwiched between the outer surface of said first panel and the outer surface of said flange and a second segment of said clip first portion being bent over said first segment and engaging the inner surface of said flange to provide said resilient gripping relation, and a second portion of said clip being planar with free edges and extending angularly from the first portion first segment and away from said flange in contact engagement with the outer surface of said second panel; and means for securing said second panel to the second portion of said clip in contact therewith, whereby said second panel conceals said clip.

3,962,841

INSULATED DECKING STRUCTURE AND METHOD

Frank E. Carroll, Barrington, Ill., assignor to Decks, Incorporated, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 457,996, April 4, 1974. This application Jan. 30, 1975, Ser. No. 545,303
The portion of the term of this patent subsequent to June 29, 1993, has been disclaimed.
Int. Cl.[2] E04C 1/00
U.S. Cl. 52—309 **15 Claims**

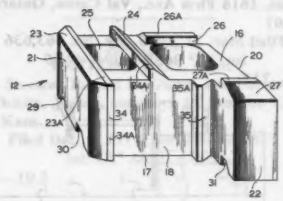


1. A poured concrete insulated deck structure comprising:
a series of parallel sheet metal structural shapes which are symmetrical about a vertical bisecting plane having a central vertical web, two legs projecting downwardly from the bottom of said web at an angle of about 45° to about 75° to the horizontal, each leg having a substantially horizontal flange projecting outwardly at its lower extremity, and a stiffening member at the upper edge of said web;
gypsum formboard resting on said horizontal flanges and extending between adjacent structural shapes;
rigid synthetic polymer foam having an underside adjacent the upper side of said gypsum form-board and having spaces vertically communicating from the upper side of said formboard to the upper side of said foam, said spaces having an area of more than about 5 percent of the area of the upper side of said formboard; and
poured concrete adjacent the upper side of said foam and around said stiffener to prevent uplift and extending through said spaces contacting the upper side of said gypsum formboard, said concrete completing drying by escape of moisture through said gypsum formboard.

3,962,842
MORTARLESS INTERLOCKING BLOCKS

William D. Wilhelm, 533 San Juan, St. Charles, Mo. 63301

Filed May 30, 1975, Ser. No. 582,160
Int. Cl.² E04B 2/20; E04C 1/12
U.S. Cl. 52—436 11 Claims

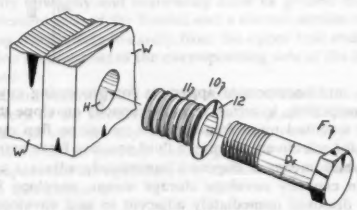


1. In a mortarless interlocking block wall assembly made up of multiple courses of stretcher blocks converging into a corner from two directions and interlocking with cooperating corner blocks in each course: the improvement of corner blocks each comprising a generally rectangular body having top and bottom surfaces, interior and exterior faces and opposite ends; a body extension on said interior face adjacent one end face and having top and bottom surfaces matching said first body surfaces; a first pair of ribs, one on said top surface of said body adjacent and parallel to said exterior face and one on said top surface of said body extension parallel to said first one of said ribs; a second pair of ribs on said body top surface in parallel and spaced relation with one of said second pair of ribs being adjacent and parallel to the opposite one of said end faces; three parallel grooves in said corner block, one being in the bottom surface of said body extension and two being in said bottom surface of said body, said grooves being parallel to said first pair of ribs; and separate means on said body interior face and on said one end face, each being adapted to engage and interlock with stretcher blocks.

3,962,843
RESILIENT SLEEVE JOINT CONSTRUCTION

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Continuation-in-part of Ser. No. 268,478, July 3, 1972, which is a continuation-in-part of Ser. No. 33,281, April 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 711,368, March 7, 1968, abandoned. This application July 12, 1973, Ser. No. 378,443
Int. Cl.² F16B 9/02
U.S. Cl. 52—758 F 8 Claims

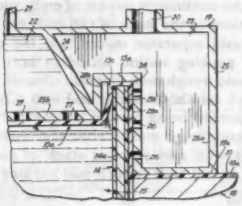


1. A joint construction comprising:
a plurality of work pieces having aligned holes therethrough of a nominal first prescribed diameter;
a fastener through said holes having a second nominal working diameter;
a sleeve member between said fastener and said work pieces within said holes including a resilient tubular metal side wall having a predetermined thickness, said side wall having formed therein a plurality of outwardly directed bends and a plurality of inwardly directed bends, said outwardly and inwardly directed bends alternating to form external ridges and valleys and internal ridges and valleys, the resiliency of said side wall urging said external ridges toward a substantially constant maximum unrestrained outside diameter along the length of said side wall a prescribed amount larger than said first prescribed diameter of said holes and urging said internal ridges toward a substantially constant minimum unrestrained inside diameter a prescribed amount smaller than said second nominal working diameter of said fastener.

3,962,844
PROCESS FOR FORMING AND APPLYING A HERMETIC, HEAT SEALED CLOSURE

Robert Louis Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 499,177, Aug. 21, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,374
Int. Cl.² B65B 51/20, 7/28
U.S. Cl. 53—39 12 Claims



1. A process for forming a hermetic, heat-sealed closure on a filled, thermoplastic or thermoplastic coated container, comprising the steps of:
providing a web of a thermoplastic material, having a temperature within the drooping and heat-sealing ranges of the thermoplastic material, draped over the mouth of the container;
urging the web inwardly of the mouth of the container so that the web simultaneously overlies both interior and exterior, thermoplastic surfaces of the mouth of the container; said interior and exterior surfaces comprising first and second thermoplastic surfaces of the mouth of the container; and
directing a stream of a gas against an exposed surface of the web overlying the first of said thermoplastic surfaces of the mouth of the container to cause the web to contact said first surface and to forcefully press the second of said thermoplastic surfaces of the mouth into contact with a portion of the web which overlies said second surface, to thereby form a heat-sealed bond between the web and both the interior and exterior thermoplastic surfaces of the mouth of the container.

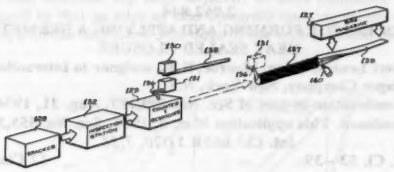
3,962,845
APPARATUS FOR COUNTING AND PACKAGING CAN ENDS

Wallace W. Mojden, Hinsdale; Jose E. Davila, Chicago; George W. Hooper, Western Springs; Gerald M. Kwiatkowski, Dolton, and Howard W. Pantel, Jr., Woodridge, all of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.

Division of Ser. No. 351,639, April 16, 1973. This application Nov. 7, 1974, Ser. No. 521,842
Int. Cl.² B65B 57/20
U.S. Cl. 53—59 R 20 Claims

1. Can end handling apparatus capable of receiving a continuous flow of can ends and automatically counting and separating a stack of ends of a prescribed number disposed in facewise, stacked relation for delivery to a packing station, or the like, said apparatus comprising: a receiving station including elongate trough means for handling a plurality of can ends

in stacked, facewise engagement; means for advancing said can ends longitudinally of said trough means to a preselected location; monitoring means responsive to the passage of said can ends past said preselected location for counting the number of can ends passing said location; and separator means operatively connected with said monitoring means and including a movably mounted element for disposition in the path of said stream of can ends at said location in response to said monitoring means, thereby to isolate a counted stack of can



ends from the continuous stream of ends, such that the downstream portions of the stack of can ends are disposed longitudinally of said separator means and the engaged counted stack, said packing station including horn means disposed relative to said trough such that said counted stack of ends can pass through said horn means and into a bag, said movably mounted element being carried by transport means movably parallel to said trough means while said movable element is in engagement with said counted stack of can ends to effect movement of said ends toward said packing station.

3,962,846

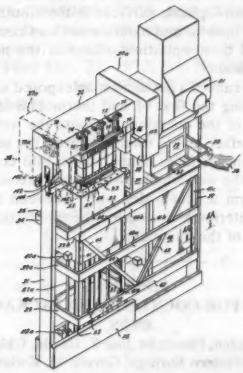
APPARATUS FOR AUTOMATIC WRAPPING OF BALES

Joseph C. Neitzel, Sao Paulo, Brazil; Ronald A. Tomlinson, Garland; Allen R. Hurst, Jr., Denison, both of Tex.; Paul W. Bodovsky, and Arnold E. Krueger, both of Sherman, Tex., assignors to Hardwicke-Etter Company, Sherman, Tex.

Continuation-in-part of Ser. No. 437,515, Jan. 28, 1974. This application Feb. 12, 1975, Ser. No. 549,156

Int. Cl.² B65B *63/02*

U.S. Cl. 53—124 C **20 Claims**



1. The combination with a baling press having charge compression means including opposed platens, of automatic bale wrapping means comprising powered mechanism for applying wrapping material across at least one of said platens prior to compression of a charge thereagainst, a press box normally positioned between and normally spaced from said platens to accommodate said mechanism, wrapper folding means movable along opposite faces of the compressed bale for applying said material to at least one of the faces of the bale, means for applying bale-securing elements about said applied wrapping material, and means for separating said box at least in part, from the bale to provide clearance for said wrapper folding means.

3,962,847

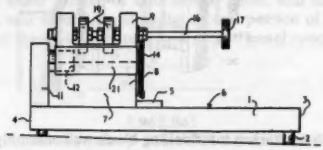
COIN WRAPPING DEVICE

Roger Trudel, 1616 First Ave., Val Caron, Ontario, Canada (P0M 3A0)

Filed Mar. 31, 1975, Ser. No. 563,636

Int. Cl.² B65B *11/04, 49/00*

U.S. Cl. 53—212 **8 Claims**



1. A coin wrapping device comprising a housing incorporating an elongated cylindrical chamber including an arcuate trough and a complementary hinged cover; a manually rotatable shaft mounted in said cover parallel with said chamber; and a friction roller on said shaft with part of its circumference projecting into said chamber in spaced relation to said trough.

3,962,848

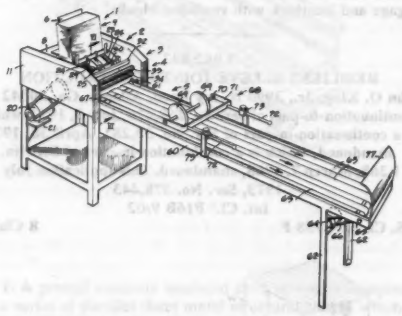
ENVELOPE FLAP PROCESSING APPARATUS

Charles William Hankins, 1218 Mission Road, South San Francisco, Calif. 94080

Filed Mar. 31, 1975, Ser. No. 563,575

Int. Cl.² B65B *7/00;* **B31B** *1/76*

U.S. Cl. 53—266 A **27 Claims**



1. A multi-component apparatus for processing envelope flaps comprising, in series; variable-capacity envelope storage means mounted upon frame means, envelope flap opening means for selectively exerting a fluid pressure force upon said flaps which means is disposed immediately adjacent to said variable capacity envelope storage means, envelope feeder means disposed immediately adjacent to said envelope flap opening means and having inlet and outlet means, said envelope feeder means being adapted to convey envelopes individually from said variable capacity envelope storage means and said envelope flap opening means to said outlet means of said feeder means, means disposed upon said frame means immediately adjacent to said outlet means for operatively supporting envelopes which have been conveyed from said outlet means of said envelope feeder means, drive means for actuating said envelope feeder means, envelope flattening and ejector means mounted upon said frame means for receiving processed envelopes which have been conveyed from said variable capacity envelope storage means to said envelope

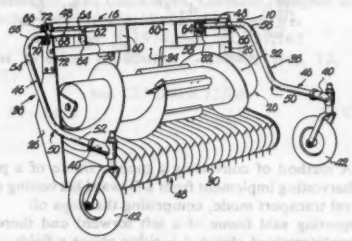
flap opening means through said envelope feeder means inlet and outlet means, said envelope flattening and ejector means being operative to apply flattening force to said envelopes which force tends to prohibit the reclosure of opened envelopes, conveying means for positively conveying processed envelopes in an orderly fashion from said apparatus to a place of utilization.

3,962,849

CASTER WHEEL ARM

Herman V. Stoessel; Ronald K. Guinn, and Bernard L. Wells, all of Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 5, 1974, Ser. No. 529,852
Int. Cl.² A01D *47/00*
U.S. Cl. 56—10.2 **7 Claims**



1. In an implement having a mobile main frame and a crop header mounted on said frame forwardly of the latter for vertical swinging movement about a horizontal axis extending transversely of the normal path of advancement of the frame, said header having a top, a bottom, and a pair of opposed sides, gauge means for swinging the header about said axis relative to the frame in response to encountering uneven terrain, said gauge means including:

a pair of elongated, generally fore-and-aft extending arms spaced outwardly from said opposite sides of the header and terminating in forwardmost free ends forwardly of the header;

a ground engaging element on each of said arms respectively at said fowardmost ends thereof for detecting rises and falls in the terrain in front of the header,

each of said arms including a first section extending generally upwardly and rearwardly from its ground engaging element toward the header and a second section extending transversely inwardly from the upper rear end of the first section toward the corresponding side of the header; and

structure securing said second section of each arm respectively to the header adjacent said top of the latter and spaced substantially above said axis vertically remote therefrom to prevent buckling under of the header in response to the application of a rearwardly directed force to said elements.

3,962,850

METHOD AND APPARATUS FOR HARVESTING TOBACCO

Bobby G. Moore, Rte. 4, Conway, S.C. 29526

Filed Aug. 1, 1974, Ser. No. 493,866
Int. Cl.² A01D *45/16*
U.S. Cl. 56—27.5 **14 Claims**

1. A mechanical tobacco harvester comprising:

a laterally stationary frame movable in rolling contact with the ground along one of a plurality of laterally spaced rows of tobacco plants;

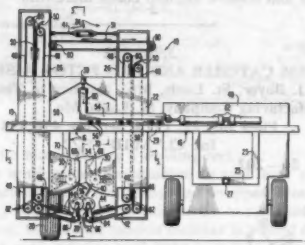
first and second panel members;

support means carried by said frame for supporting said panel members to form therebetween an elongated passage of predetermined width extending in a direction generally parallel to the direction of movement of said frame;

passage width adjusting means interconnecting said panel members for varying the width of the elongated passage therebetween;

first and second defoliating means carried respectively by said panel members for at least partially defoliating successive tobacco plants disposed in a defoliating position relative thereto;

guiding means carried by said panel members for guiding individual tobacco plants into and through the elongated passage in an essentially predetermined spatial relationship with said defoliating means as said frame moves along the row; and,



first and second conveying means carried respectively by said panel members laterally adjacent the elongated passage for collecting tobacco leaves removed from tobacco plants by said defoliating means and for conveying the collected leaves laterally and vertically away from said defoliating means,

said support means including pivotable supporting means for pivotably supporting said panel members to thereby permit rotation of said panel members as a unit about a generally horizontal axis generally parallel to the direction of movement of said frame in response to contact between the tobacco plants and said guiding means,

said support means also including lateral positioning means for positioning said panel members laterally as a unit relative to said frame to thereby selectively position said defoliating means in a defoliating position relative to the tobacco plants of another of the laterally spaced rows of tobacco plants without laterally repositioning said frame relative to the rows of tobacco plants.

3,962,851

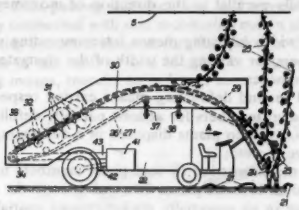
SELF-PROPELLED HOP HARVESTING MACHINE

Adolf Liepold, Schwarzenbruck; Hermann Daum, Feucht near Nurnberg, and Helmut Lindner, Rothenbach, all of Germany, assignors to Fella-Werke G.m.b.H., Nurnberg, Germany

Filed Dec. 9, 1974, Ser. No. 531,105
Claims priority, application Germany, Dec. 7, 1973, 2360989
Int. Cl.² A01D *41/08*
U.S. Cl. 56—126 **3 Claims**

1. A self-propelled hop harvesting machine comprising drive means for propelling the machine in a forward direction, a vine draw-through means in the form of two endless chains arranged side-by-side and providing an upper vine-conveying run and a lower return run, an upwardly open U-shaped member extending arcuately over the top of the machine from the front thereof and housing and guiding said upper vine-conveying run of the said chains, means for driving said chains so that

said upper run moves in a rearward direction and picking means located in the path of movement of a vine when con-



veyed by said upper run of the chains constructed to engage said vine and remove the hop cones therefrom.

3,962,852

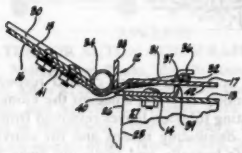
GRASS CATCHER AND DEFLECTOR ASSEMBLY

Walter J. Boyer, St. Louis, Mo., assignor to The Perfection Manufacturing Company, St. Louis, Mo.

Filed July 22, 1974, Ser. No. 490,858

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 **5 Claims**



1. In combination with a lawn mower housing of the type having a discharge opening and an upper wall above the discharge opening, a grass catcher and deflector assembly, said assembly comprising:

a. a bracket adapted to be fixedly attached to said housing upper wall and including:

1. a first engagement means disposed forwardly of said mower discharge opening and having a portion spaced from said housing upper wall in overlying relation thereto, and

2. a second engagement means rearwardly spaced from said first engagement means and including a slot means,

b. a deflector including:

1. arm means mounted to the second engagement means, the arm means being received in pivotal relation within said slot means and pivotally movable below said overlying first engagement means portion, and

2. a rearwardly extending flap means attached to said arm means and movable away from a lowered deflecting position relative to said discharge opening into a raised, non-deflecting position as said arm means moves below said overlying first engagement means portion, and

c. a removable grass catcher having an opening adapted to receive grass clippings from the discharge opening and including frame means having a first transverse element forwardly disposed of the catcher opening and insertable between said overlying first engagement means portion and said arm means when the arm means is moved to the position below said overlying first engagement means portion to latch said deflector in said non-deflecting position.

3,962,853

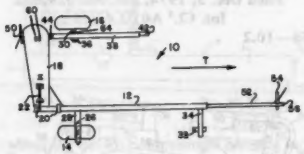
METHOD OF CONVERTING AN IMPLEMENT FRAME FROM A FORWARD HARVESTING MODE TO A LATERAL TRANSPORT MODE

Bruce D. Schwalm, Leola, and Bryant F. Webb, Ephrata, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 29, 1974, Ser. No. 456,416

Int. Cl.² A01D *75/22*

U.S. Cl. 56—228 **8 Claims**



1. A method of converting a mobile frame of a pull-type crop harvesting implement from a forward harvesting mode to a lateral transport mode, comprising the steps of:

supporting said frame at a left forward end thereof at a predetermined elevated position above a field;

pivoting a field tongue connected to said left forward frame end from a fowardly-extending position, in which said tongue may be coupled to a tractor or the like for towing said implement in a forward direction in its harvesting mode, toward a right lateral side of said frame to a transversely-extending fixed position with said frame being stationarily-positioned during said pivoting of said field tongue;

pivoting one of two rotatably spaced-apart ground wheels, which is mounted to and supports said frame at a left rearward end thereof, from a forwardly-directed position to a transversely-directed position;

disposing a transport tongue at said right lateral side of said frame in a fixed position extending outwardly from said right lateral frame side;

supporting said frame at said right lateral side thereof at a predetermined elevated position above the field;

removing the other of said two ground wheels which is mounted in a forwardly-directed position and supports said frame at a right rearward side thereof;

remounting said other wheel in a transversely-directed position along said transversely-extending field tongue; and

removing said support from said left forward frame end.

3,962,854

RAKE MACHINE

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Filed Oct. 11, 1974, Ser. No. 514,307

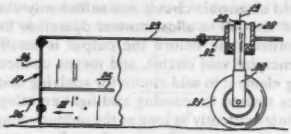
Claims priority, application Netherlands, Oct. 12, 1973, 7314028; Jan. 18, 1974, 7400685; Feb. 18, 1974, 7402172; July 2, 1974, 7407753; June 19, 1974, 7408181; July 2, 1974, 7408894; Sept. 9, 1974, 7411914

Int. Cl.² A01D *79/02*

U.S. Cl. 56—370 **44 Claims**

1. A rake machine for displacing crop on the ground comprising a frame and at least one rake member supported on said frame, said member being rotatable about an upwardly extending axis, said member having an outer circumference

and said circumference being formed by a deformable wall, means on said member for restricting the amount of deformation of at least the lower portion of said wall, crop working means being supported on said wall.



3,962,855

START-SPINNING APPARATUS WHICH TRAVELS ALONG AN OPEN-END SPINNING MACHINE

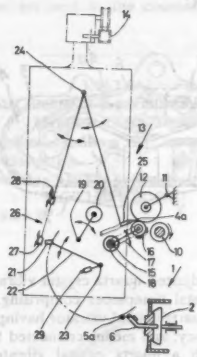
Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, Germany

Filed Dec. 9, 1974, Ser. No. 531,162

Claims priority, application Germany, Dec. 12, 1973, 2361787

Int. Cl.² D01H *15/00*

U.S. Cl. 57—34 R **26 Claims**



1. A start-spinning apparatus which travels along an open-end spinning machine having at least one yarn removal channel connected with a respective at least one spinning rotor, comprising means for lifting away a winding cone of an open-end spinning unit, trimming means, a pair of trapping rollers, a movably arranged suction nozzle for picking up an end of thread from said winding cone and placing said end of said thread into the effective area of said trimming means and said pair of trapping rollers, and movably arranged transfer trapping means for trapping said end of said thread in the area of said trapping means and transferring said end of said thread to the yarn removal channel, whereby said pair of trapping rollers controls the return of said end of said thread into said spinning rotor and withdrawal therefrom again.

3,962,856

DOFFING APPARATUS

Heinrich Weller, Monchen gladbach, and Heinz Kaschewske, Korschenbroich, both of Germany, assignors to Maschinenfabrik Heinz Weller, Monchen gladbach, Germany

Filed Oct. 16, 1974, Ser. No. 515,153

Int. Cl.² D01H *9/04*

U.S. Cl. 57—52 **7 Claims**

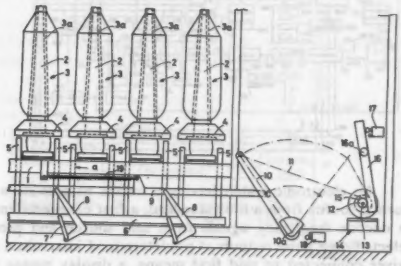
1. In a spinning frame having a plurality of tapered rotatable spindles, each carrying a bobbin upon which fiber is wound, and each spindle having a disc mounted thereon below its respective bobbin, said disc being movable axially with respect to the spindle:

a vertically reciprocable plunger located below each bobbin and engageable with the underside of said disc to lift the bobbin free of the spindle;

linkage means connected to the plungers to move them upwardly in unison;

a lever arm pivoted for angular movement;

said linkage means being connected to said lever arm at a point spaced from said pivot;



a reversible motor driving a winding reel;

a flexible tension member attached to said lever arm at a point spaced from said pivot, and wrapped around said winding reel, whereby as said motor is operated in one direction, the flexible tension member is wound onto the winding reel, causing said linkage means to raise said plungers and thereby eject said bobbins from said tapered spindles; and

means for stopping said motor automatically when said bobbins have been ejected.

3,962,857

MACHINE FOR SIMULTANEOUSLY TWISTING A PLURALITY OF YARNS

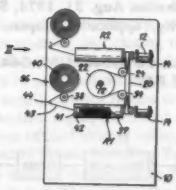
Edmund Hamel, Romanshorn/TG, Switzerland, assignor to Evolution S.A., Rorschach, Switzerland

Filed Oct. 22, 1974, Ser. No. 517,015

Claims priority, application Germany, Oct. 24, 1973, 2353311

Int. Cl.² D01H *7/10, 7/08*

U.S. Cl. 57—59 **17 Claims**



1. An apparatus for twisting a plurality of yarns, said apparatus comprising:

a horizontally elongated support;

a plurality of twisters on said support each having a respective yarn package and a respective rotatable sleeve surrounding said package, said twisters each being rotatable about a respective horizontal axis transverse to said support;

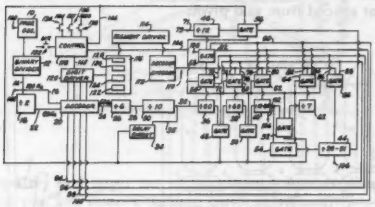
takeup means for drawing respective yarns from said packages of said twisters; and

drive means extending longitudinally through said support for rotating said twisters about their respective axes.

3,962,858
ELECTRONIC WATCH

Morris M. Levine, Scarsdale, and Arthur F. Cake, Smithtown, both of N.Y., assignors to Uranus Electronics Inc., Port Chester, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,516
Int. Cl.² G04B *19/24*, *19/30*
U.S. Cl. 58—4 A 18 Claims

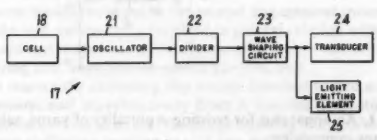


1. An electronic watch having a means to provide a frequency source from a time standard, a first electronic means to decode frequency signals from said source and provide selected digit pulse outputs at predetermined intervals, a digit driver connected to said first means, a display means connected to said digit driver, a binary divider chain connected to said frequency source continuously operable with counter means to provide pulses representative of seconds, minutes, hours, days of the month, days of the week and months in proper sequential order, said divider chain comprised of gate means to advance each portion thereof in accordance with pulses starting with the portion of the counter means providing pulses representative of seconds, said gate means comprised of a differentiator circuit of NOR gates and an advancing and setting circuit of NAND gates, decoder-encoder means connected to said binary divider chain, a segment driver connected to said decoder encoder means and said display means, and a control meas connected to said binary divider chain and said digit driver to control the activation of said display in indicating selected information of hours - minutes, days of the month- seconds, days of the week- months at selected pulses from said decoder.

3,962,859
CELL REPLACEMENT INDICATION DEVICE

Kazuo Ito, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation of Ser. No. 281,187, Aug. 16, 1972, abandoned. This application Aug. 21, 1974, Ser. No. 499,206
Claims priority, application Japan, Aug. 20, 1971, 46-74319[U]
Int. Cl.² G04C *3/00*; G04B *19/30*
U.S. Cl. 58—23 BA 6 Claims

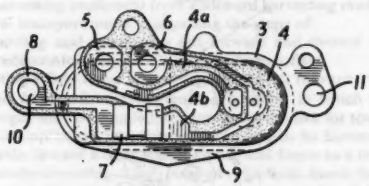


1. In a watch having an electronic circuit powered during use by an electric cell and means in said circuit for developing low-frequency pulses, and time-indicating means responsive to said low-frequency pulses for indicating the time: a device separate from said time-indicating means for displaying visually that the operating life of said cell is near exhaustion comprising a light-emitting element having a threshold voltage selected relative to the output voltage of said cell to indicate by light emissions that said output voltage exceeds a certain value and upon termination of light emissions in dependence upon said output voltage being below said certain value indicating that the cell needs replacement, said output voltage value being selected above a potential level for adequately energizing said electronic circuit and sufficiently close to the exhaustion of the cell to allow normal operation for a short remaining limited time before the output is insufficient to adequately energize said circuit, and means connecting said light-emitting element to said circuit for applying said low-frequency pulses thereto for causing said light-emitting element to emit light intermittently as long as the output voltage of said cell exceeds said certain value and thereafter automatically terminating the light emissions from said light-emitting element due to the dropping of the output voltage of said cell below said threshold voltage to thereby visually indicate by the absence of light emissions that the output of said cell is near exhaustion.

3,962,860
QUARTZ CRYSTAL TIMEPIECE

Kotaro Kato, Tokyo, and Makoto Morimoto, Chiba, both of Japan, assignors to Kabushiki Kaisha Daini, Japan

Filed Aug. 30, 1974, Ser. No. 502,185
Claims priority, application Japan, Aug. 31, 1973, 48-102223
Int. Cl.² G04C *3/00*; H03B *5/30*
U.S. Cl. 58—23 AC 13 Claims



1. A coarsely adjusted quartz crystal vibrator package for use in quartz crystal timepieces comprising: a case having sealed therein a quartz crystal vibrator having its own natural oscillating frequency; and means connected to said case and defining therewith a quartz crystal vibrator package for coarsely compensating for deviation of the natural oscillating frequency of said quartz crystal vibrator from a predetermined time-base standard oscillating frequency thereby providing a coarsely adjusted quartz crystal vibrator package for use in quartz crystal timepieces.

3,962,861
APPARATUS FOR DETERMINING AND LASTINGLY SHOWING THE TIME AT WHICH AN EVENT OCCURS

Jean-Claude Protta, Onex, and Antoine Savary, Chatelaine, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Continuation-in-part of Ser. No. 320,675, Jan. 2, 1973, abandoned. This application June 7, 1974, Ser. No. 477,277
Int. Cl.² G04F *10/04*; G04B *19/24*
U.S. Cl. 58—39.5 9 Claims

1. Apparatus for determining and temporarily recording the time an event occurs, comprising:

A. a time counter,

B. a memory,

C. a time indicator, the time counter being coupled to the memory and the time indicator

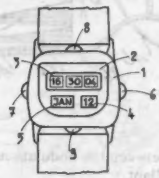
D. means for providing an active connection between

a. the counter and the memory, and

b. the counter and the time indicator, wherein the connection is arranged such that when the means for pro-

viding said connection with the memory is actuated, the time indicator indicates the time when said connection has become effective

wherein the memory is a storage memory, the connecting means between said memory and said counter being arranged such that when said connecting means becomes operative the



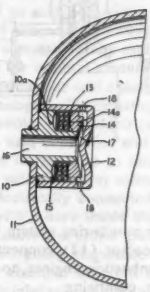
counter is temporarily blocked, the counting pulses are bypassed to and collected by the memory and, when the latter is fully loaded, the same number of pulses which are stored in the memory but having a frequency higher than that of the counting pulses are sent to the counter for time resetting purposes.

3,962,862

EXPLOSION ENERGY ABSORBER FOR ROCKET MOTOR INJECTORS

Joseph J. Lovingham, Madison, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Filed May 21, 1968, Ser. No. 730,744
Int. Cl.² F02K 9/02
U.S. Cl. 60—39.09 R **1 Claim**



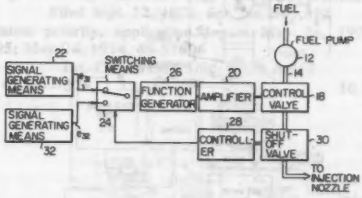
1. In a rocket motor oxidizer injector having a housing and a passage for pressurized oxidizer through said housing, the improvement comprising a free piston slidable in said housing and exposed to the oxidizer passage, a viscoelastic material interposed between the piston and the housing with the piston face adjacent to the viscoelastic material shaped to a predetermined contour and its counterpart face on the housing being of substantially the same contour and with the viscoelastic material bonded between concentric metal rings in alternate layers with the rings substantially parallel to the central axis of the piston.

3,962,863

GAS TURBINE ENGINE FUEL SUPPLY CONTROL

Takane Itoh, Yokohama, and Takao Kamide, Zushi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 26, 1974, Ser. No. 527,373
Claims priority, application Japan, Nov. 28, 1973, 48-132557; Nov. 28, 1973, 48-132558; Nov. 28, 1973, 48-132559
Int. Cl.² F02C 7/26
U.S. Cl. 60—39.14 **11 Claims**



1. A fuel supply control for firing a gas turbine engine including a fuel pump provided in a fuel conduit for supplying pressurized fuel into a combustion chamber of said gas turbine engine, which comprises:

an electromagnetic flow control valve provided in said fuel conduit between said fuel pump and said combustion chamber, and responsive to a control signal fed thereto from fuel supply control means for controlling fuel flow to said combustion chamber in accordance with said control signal;

said fuel supply control means operatively connected to said electromagnetic flow control valve for supplying thereto said control signal which increases continuously in magnitude from a first preset value to a second preset value after engine starting operation;

a shut-off valve provided in said fuel conduit between said fuel pump and said combustion chamber for blocking and unblocking delivery of said fuel flow to said combustion chamber;

a shut-off valve controller operatively connected to said shut-off valve for opening and closing the same and for generating therefrom a signal indicative of open and closed conditions of said shut-off valve, said signal being fed to said fuel supply control means to cause the same to develop said control signal when said signal represents the open condition of said shutoff valve;

said fuel supply control means including first control signal generating mean initially connected to function generating means through switching means for applying thereto a first present signal indicative of said first present value,

said switching means receiving said signal from said shutoff valve controller, and disconnecting said first control signal generating means from said function generating means and connecting second control signal generating means to the latter when said signal indicates the open condition of said shut-off valve,

said second control signal generating means generating a second present signal indicative of said second preset value, and

said function generating means electrically interposed between said switching means and said electromagnetic flow control valve, and producing said control signal.

3,962,864
GAS TURBINE POWER PLANT WITH EXHAUST TREATMENTS FOR SO_x REMOVAL

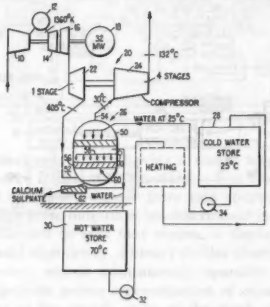
David Eyre Williams, Brinklow, and Albert Jubb, Kenilworth, both of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Sept. 13, 1974, Ser. No. 505,948

Claims priority, application United Kingdom, Sept. 20, 1973, 44079/73

Int. Cl.² F02G *3/00;* **F02C** *7/08;* **C01B** *17/00*

U.S. Cl. 60—39.16 R **3 Claims**



1. An energy system comprising a gas turbine engine including a first compressor means, a combustion means receiving the output of said first compressor means, a first turbine means connected to said combustion means for driving said first compressor means, a power turbine means, and a load driven by said power turbine means, a second compressor means, a second turbine means for driving said second compressor means, a housing, means within said housing for cooling the exhaust gases from said second turbine means, said cooling means including a heat exchanger matrix positioned in said housing, a cold water store, a hot water store, and means for conveying a supply of cold water from said cold water store to said housing, said cold water cooling the hot exhaust gases from said second turbine means in said heat exchanger matrix positioned in said housing, means in said housing for removing pollutants from said exhaust gases, the hot exhaust gases from said power turbine flowing to said housing by way of said second turbine, and flowing from said housing to the atmosphere by way of said second compressor means, said pollutant removing means receiving said water from said heat exchanger matrix and converting said water into steam which thereafter flows back to said matrix--., said steam condensing in the heat exchanger matrix, and means for collecting and passing said condensed steam to said hot water store.

3,962,865
ROCKET MOTOR CONSTRUCTION

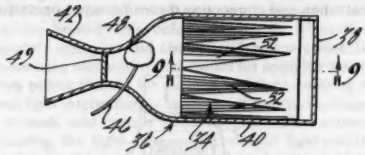
Alan I. McCone, Jr., San Francisco, Calif., assignor to MB Associates, San Ramon, Calif.

Continuation of Ser. No. 276,731, July 31, 1972, abandoned. This application Nov. 16, 1973, Ser. No. 416,639

Int. Cl.² F02K *9/04*

U.S. Cl. 60—255 **5 Claims**

1. In a rocket motor, a motor casing having a cylindrical side wall, a flat front wall and a nozzle at the rear thereof, a fuel grain within said closure having a central supporting strip, a pair of propellant strips, means adherring said propellant strips to opposite sides of said supporting strip, one edge of said strips being undulated, the other edge of said central supporting strip being extended beyond the propellant strips, and tapes of greater thickness than said propellant strips secured to the surfaces of said extended edge of said supporting strip so that when rolled up and slid within the casing, spaces will be provided between the propellant in each convolution



as well as those between the undulations providing axial burning of said propellant.

3,962,866
INTERNAL COMBUSTION EXHAUST CATALYTIC REACTOR MONITORING SYSTEM

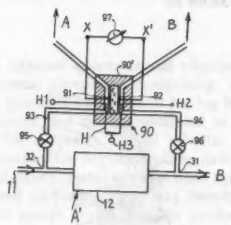
Horst Neidhard, Korntal; Ernst Linder, Muhlacker; Josef Wahl, Stuttgart; Peter Jurgen Schmidt, Schwieberdingen, all of Germany, and Peter A. Schoeck, Balzers, Liechtenstein, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Jan. 28, 1974, Ser. No. 436,863

Claims priority, application Germany, Jan. 31, 1973, 2304622

Int. Cl.² F02B *75/10;* **F01N** *3/15;* **F02M** *25/06*

U.S. Cl. 60—276 **14 Claims**



1. Catalytic reactor monitoring system to supervise operation of a catalytic reactor (12) connected to the exhaust system of internal combustion engines, to detoxify exhausted gases from the engine, comrising

at least one oxygen sensor (90) to determine oxygen content in the exhaust gases from the internal combustion engine and comprising an ion conductive solid electrolyte (21) forming an ion concentration chain and which includes two catalytically inactive electrodes (91, 92);

means (93–96) branching the exhaust gases from the internal combustion engine upstream and downstream of the catalytic reactor (12) respectively, one electrode being responsive to the upstream branch and the other electrode being responsive to the downstream branch;

a detection circuit (20) connected to the sensor (90) providing an output signal in dependence on the signal from the sensor;

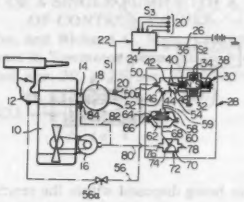
and response means (39, 34) responsive to the output signal from the detection circuit (20).

3,962,867

SECONDARY AIR REGULATING SYSTEM

Kenji Ikeura, Yokohama, and Yoshitaka Hata, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed June 26, 1974, Ser. No. 483,289
Claims priority, application Japan, June 27, 1973, 48-72678
Int. Cl.[2] F02B 75/10; F01N 3/10
U.S. Cl. 60—276 3 Claims



1. A secondary air regulating system for an exhaust purifying device of an internal combustion engine having an air intake passage and an exhaust passage in which said exhaust purifying device is disposed, which system in combination comprises:

secondary air supply means connected to a portion upstream of said exhaust purifying device in said exhaust passage for supplying secondary air into said portion;

a sensor disposed downstream of said exhaust purifying device in said exhaust passage for generating a first signal in response to a predetermined concentration of a predetermined component being sensed in exhaust gases discharged from said exhaust purifying device;

a controller electrically connected to said sensor for producing a second signal in response to said first signal from said sensor; and

regulating means electrically connected to said controller and connected to said secondary air supply means for controlling said secondary air supply means in response to said second signal, whereby said secondary air supply means supplies the optimal amount of secondary air into the portion upstream of said exhaust purifying device in said exhaust passage, said regulating means comprising,

a three way solenoid valve electrically connectable and respondable to said controller and communicating with said air passage in response to said second signal from said controller, said three-way solenoid valve including a solenoid coil electrically connected with said controller and provided with a bore inside thereof, said coil being variably energizable by either polarity of said second signal and the energizing magnitude of said second signal, an atmospheric chamber adjacent to said bore and provided with an air inlet port communicating with the atmosphere, a vacuum chamber adjacent to said atmospheric chamber through a partition wall having an opening therethrough and provided with a vacuum inlet port communicating with said air intake passage and a vacuum outlet port communicating with said diaphragm assembly, an elongate permanent magnet plunger slidably disposed in said bore inside of said solenoid coil, said plunger being reversably movable therein in dependence on the polarity of solenoid coil and in response to the energizing signal magnitude of said solenoid coil, biasing means biasing said plunger at both ends thereof for holding it at neutral position, and a needle valve integrated with said plunger and being movably disposed in said opening of said partition wall so as to determine the opening area of said opening in accordance with the movement of said plunger,

a diaphragm assembly communicating with said air intake passage through said three-way solenoid valve for actuation by the vacuum regulated by said solenoid valve, and

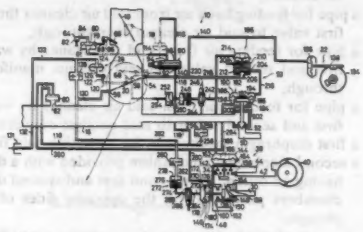
a relief valve mechanically connected to said diaphragm assembly, said relief valve communicating with said air supply means for control of said air supply means in response to said second signal from said controller.

3,962,868

EXHAUST GAS PURIFYING SYSTEM FOR USE IN INTERNAL COMBUSTION ENGINE

Noboru Matumoto; Takao Nonoyama, both of Toyota; Tutomu Tomita, Okazaki, and Yukio Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sept. 12, 1974, Ser. No. 505,572
Claims priority, application Japan, May 24, 1974, 49-57805; May 24, 1974, 49-57806
Int. Cl.[2] F02M 25/06; F02B 75/10
U.S. Cl. 60—278 10 Claims



1. An exhaust gas purifying system for use in an internal combustion engine, which is provided with an air cleaner, a suction pipe connected to said air cleaner, a choke valve and a throttle valve provided in said suction pipe and means for attaching the throttle valve for movement within the suction pipe, an exhaust manifold and a catalyst converter connected to said manifold, the throttle valve having an idle opening position at which the throttle valve is substantially closed and the engine is in the condition of normal idle running, the throttle valve also having a throttle opening position wherein the throttle valve is substantially open, comprising:

a first port provided between the idle opening position of said throttle valve in said suction pipe and the throttle opening position;

a second port provided in said throttle opening position of said throttle valve in said suction pipe;

a third port provided on the upstream side but in the vicinity of means for attaching the throttle valve in said suction pipe;

a vacuum ignition advancer adapted to be operated due to a negative pressure introduced through said first port;

a throttle positioner adapted to be operated due to negative pressure introduced through said second port for temporarily preventing the throttle valve from assuming the idle opening position;

a choke opener adapted to be operated due to a negative pressure on the downstream side of said suction pipe and a fast idle device;

means for introducing the negative pressure prevailing on the downstream side of said suction pipe, to said choke opener and said fast idle device;

means for controlling the introduction of the negative pressure to the fast idle device according to the temperature at said internal combustion engine;

an air switching device provided with first and second valves;

an air feed pipe connecting said air switching device to said air cleaner;

a pipe for feeding back air from said air cleaner through said first valve to said air cleaner therethrough;

a pipe for feeding air from said air cleaner by way of said first and second valves to said exhaust manifold therethrough;

a pipe for feeding air from said air cleaner by way of said first and second valves to said catalyst convertor;

a first diaphragm mechanism for actuating said first valve;

a second diaphragm mechanism provided with a diaphragm having an orifice therein, and first and second diaphragm chambers positioned on the opposite sides of said diaphragm;

means for introducing a negative pressure prevailing on the downstream side of said suction pipe to the diaphragm chamber in said first diaphragm mechanism;

means for controlling the introduction of a negative pressure to said diaphragm chamber in said first diaphragm mechanism according to the negative pressure fed through said third port as well as to the temperature of said internal valves;

an air feed pipe connecting said air switching device to said air cleaner;

a pipe for feeding back air from said air cleaner through said first valve to said air cleaner therethrough;

a pipe for feeding air from said air cleaner by way of said first and second valves to said exhaust manifold therethrough;

a pipe for feeding air from said air cleaner by way of said first and second valves to said catalyst convertor;

a first diaphragm mechanism for actuating said first valve.

a second diaphragm mechanism provided with a diaphragm having an orifice therein, and first and second diaphragm chambers positioned on the opposite sides of said diaphragm;

means for introducing a negative pressure prevailing on the downstream side of said suction pipe to the diaphragm chamber in said first diaphragm mechanism;

means for controlling the introduction of a negative pressure to said diaphragm chamber in said first diaphragm mechanism according to the negative pressure fed through said third port as well as to the temperature of said internal combustion engine;

means for controlling the pressure in the second diaphragm chamber in said second diaphragm mechanism according to the negative pressure introduced through said second opening as well as to the temperature at said internal combustion engine; and

means for introducing a negative pressure prevailing on the downstream side of said suction pipe to said first diaphragm chamber in said second diaphragm mechanism.

3,962,869

EQUIPMENT FOR EXHAUST GAS DETOXIFICATION IN INTERNAL COMBUSTION ENGINES

Gunter Wossner, Esslingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

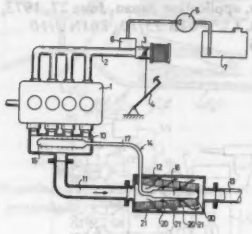
Filed Aug. 28, 1973, Ser. No. 392,311

Claims priority, application Germany, Sept. 4, 1972, 2243428

Int. Cl.² F01N 3/14

U.S. Cl. 60—298 **3 Claims**

1. In equipment for exhaust gas detoxification of internal combustion engines of the type that includes an exhaust system with an exhaust manifold and an exhaust pipe and at least one thermal or catalytic reactor within the exhaust system, the improvement comprising: a heat pipe within which a working fluid flows, said heat pipe containing three zones, a first zone serving as an evaporation zone, said evaporation zone being disposed in the vicinity of the exhaust valves of the internal combustion engine for accepting heat from the exhaust gas, a second zone serving as the transport zone for the transport of the working medium between the first and third zones, said second zone being of flexible construction, extending along the outside of the exhaust pipe and having insulating material surrounding the outer surface of the respective portion of the heat pipe to substantially prevent heat flow from the second zone to its surroundings, and a third zone serving as a condensation zone and giving off heat to its surroundings, said condensation zone being disposed within the reactor; and a radially permeable capillary tube formed as a helically wound wire lying within the heat pipe such that through and along its interior the working medium flows in a vapor phase towards the condensation zone and along its outside the working medium flows in a liquid phase toward the evaporation zone.



3,962,870

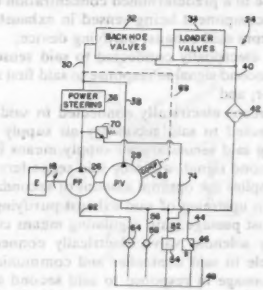
VARIABLE VOLUME DUAL PUMP CIRCUIT

Richard J. Lech, Lockport, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Apr. 23, 1975, Ser. No. 570,974

Int. Cl.² F15B 13/09

U.S. Cl. 60—428 **7 Claims**



1. In a hydraulic fluid control circuit for use on a vehicle having an engine means capable of providing driving means, a work circuit composed of a plurality of cylinders, a reservoir and a conduit means for distributing fluid flow, the improvement comprising:

a fixed displacement pump being driven by said driving means for providing fluid to said work circuit by means of said conduit means;

a variable displacement pump being driven by said driving means and providing fluid to said work circuit by means of said conduit means;

an actuating compensator for effecting the displacement output of said variable displacement pump communicating with the output of said variable displacement pump and said conduit means and responsive to fluid pressure in said conduit means whereby higher pressure in said conduit means actuates said actuating compensator to decrease the stroke of said variable displacement pump and whereby low pressure in said conduit means actuates said actuating compensator to increase the stroke of said variable displacement pump;

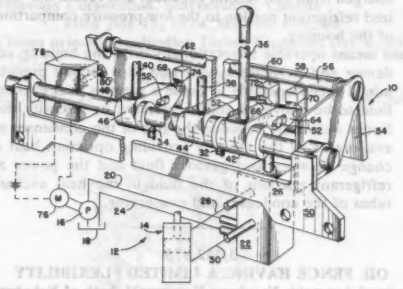
a relief valve responsive to relieve pressure in said conduit means at a pressure higher than the pressure needed to fully destroke said variable displacement pump whereby actuation of said relief valve will allow fluid being pumped by said fixed displacement pump to be passed to the reservoir.

3,962,871

CONTROL MEANS ADJUSTABLY SYNCHRONIZING OPERATION OF A SINGLE PUMP WITH A PLURALITY OF CONTROL VALVES

James G. Blaha, and Richard C. Maher, both of Painesville, Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Apr. 30, 1975, Ser. No. 572,995
Int. Cl.² F15B 15/18, 11/16
U.S. Cl. 60—433 7 Claims



1. In a hydraulic circuit for operating a plurality of hydraulic motors by a single pump, a separate valve being operable to communicate actuating fluid to each respective motor, each of the valves being operable by a separate movable actuating element, the single pump under pressure being in communication with each of the valves, synchronizing means for initiating operation of the pump simultaneously with movement of any one of the valves to communicate fluid from the pump to one of the motors, comprising

a movable gang plate including means for initiating and terminating operation of the pump in response to movement of the gang plate about a fixed pivot point,

a separate cam shoe being associated with each of the actuating elements for the respective control valves, each of the cam shoes forming an actuating surface arranged generally perpendicular to the fixed pivot axis of the gang plate,

means adjustably securing the separate cam shoes to the gang plate, and

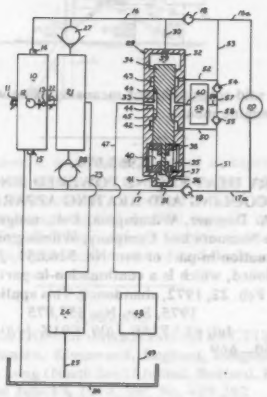
a synchronizing lever connected with each actuating element for the respective control valves, each synchronizing lever having a bearing means arranged for engagement with one of the actuating surfaces upon the cam shoes, the synchronizing levers being pivotably movable in response to operation of the respective control valves by their actuating elements to move the bearing means along the actuating surfaces, each of the actuating surfaces having a configuration formed along a plane perpendicular to the fixed pivot of the gang plate for moving the gang plate and causing operation of the single pump in synchronization with the movement of each of the control valves.

3,962,872

HYDROSTATIC TRANSMISSION MIXED LOOP SYSTEM

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

Filed Mar. 3, 1975, Ser. No. 554,619
Int. Cl.² F15B 15/18
U.S. Cl. 60—453 38 Claims



1. A fluid power transmission and control system having a variable delivery fluid pump and a fluid motor, said pump and said motor each having fluid conducting port means and a system reservoir, the improvement which comprises, a fluid distributing and control system interposed between said fluid conducting port means of said pump and said motor, said distributing and control system including a suction fluid conducting means interconnecting said pump and said reservoir to deliver from said reservoir full suction flow requirements of said variable delivery pump, means for phasing full suction flow requirements of said variable delivery pump transmitted through said suction fluid conducting means to a low pressure fluid conducting port means of said pump, a motor exhaust fluid diverting means to selectively divert full flow of motor exhaust fluid to the reservoir, a motor speed synchronizing means to synchronize the motor speed with the fluid flow from the pump, said motor exhaust diverting means and said motor speed synchronizing means including means to operate said motor exhaust diverting means and said motor speed synchronizing means in response to the pressure of the fluid supplied from the pump to the motor.

3,962,873

SOLAR STEAM GENERATOR

Jerry P. Davis, Concord, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed May 20, 1974, Ser. No. 471,417
Int. Cl.² F03G 7/02
U.S. Cl. 60—641 8 Claims

1. A method for producing process steam comprising the steps of:

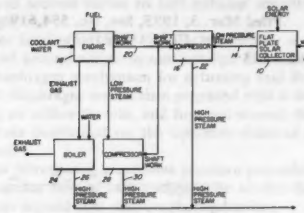
a. generating steam by non-focusing solar collector means at pressures below the minimum pressure for useful process steam;

b. pressurizing steam from said solar collector means by a mechanical compressor;

c. driving said compressor by engine means energized as a

result of fuel consumption; and

d. producing and pressurizing steam in addition to the steam



from said solar collector means by using waste heat from said engine means.

3,962,874

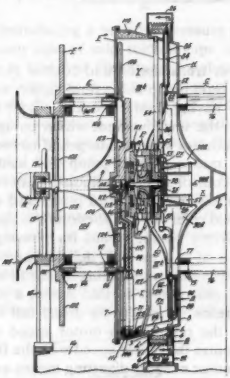
ROTARY HEAT ENGINE POWERED SINGLE FLUID COOLING AND HEATING APPARATUS

William A. Doerner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 316,851, Jan. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 277,902, Feb. 22, 1972, abandoned. This application Mar. 12, 1975, Ser. No. 557,875

Int. Cl.[2] F25B *3/00;* **F01K** *11/04*

U.S. Cl. 60—669 **16 Claims**



1. Rotary closed Rankine cycle engine powered heating and cooling apparatus utilizing a single fluid for both engine power and refrigeration comprising

a cylindrical housing mounted for rotation about the axis thereof including an internal boiler for the engine power portion of said single fluid,

means for heating the fluid in said boiler to generate pressure power fluid vapor therein,

means subdividing the interior of said rotatable housing to provide a high pressure fluid compartment and a low pressure fluid compartment,

a first expander in said housing for expanding the pressure power fluid generated in the boiler and discharging the expanded fluid to the high pressure compartment of the housing, including a coaxial driving member rotatably driven at a first predetermined speed by said power fluid,

a compressor rotatably mounted coaxially in the housing driven by said first expander driving member and operable to compress the refrigerant portion of the single fluid in said low pressure fluid compartment and discharge the compressed refrigerant to said high pressure compartment of the housing,

a condenser mounted coaxially of the housing and rotatable therewith comprising a plurality of axially spaced radial annular fins having heat exchange tubes extending longitudinally therethrough an communicating with the high pressure compartment of the housing to receive and condense therein the power and refrigerant portions of said single fluid discharged from the first expander and compressor,

a second expander in said housing for expanding the refrigerant portion of the fluid condensed in said condenser,

means for dividing and supplying the liquid condensed in the condenser to the boiler and to said second expander in predetermined proportions,

an evaporator mounted coaxially of the housing and rotatable therewith comprising a plurality of axially spaced annular fins having heat exchange tubes extending longitudinally therethrough and communicating with the low pressure compartment of the housing to receive the vaporize therein the refrigerant portion of the fluid discharged from said second expander and return the vaporized refrigerant portion to the low pressure compartment of the housing.

and means operable to rotationally drive the housing, condenser and evaporator as a unit at a second predetermined speed operable to cause a gaseous heat exchange fluid to be conveyed and accelerated by viscosity shear forces outwardly between the fins of the condenser and evaporator to the velocity providing optimum heat exchange between said gaseous fluid and the power and refrigerant portions of the fluid in the heat exchange tubes of the condenser and evaporator.

3,962,875

OIL FENCE HAVING A LIMITED FLEXIBILITY

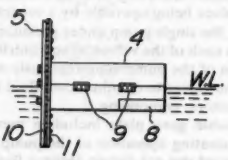
Kuninori Aramaki; Yasuharu Kawaguchi, both of Yokohama, and Hiroshi Kawakami, Kamakura, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 373,222, June 25, 1973, Pat. No. 3,867,817. This application Oct. 23, 1974, Ser. No. 517,576

Claims priority, application Japan, June 29, 1972, 47-64431

Int. Cl.[2] E02B *15/04*

U.S. Cl. 61—1 F **2 Claims**



1. An oil fence having a limited flexibility in the transverse direction, said oil fence comprising:

a. at least three rigid floats arranged side by side in the longitudinal direction of the fence;

b. a rigid planar skirt attached to a first end of each of said rigid floats along the longitudinal direction of the fence, each of said first ends of said rigid floats being adjacent the first ends of the adjacent floats, said rigid planar skirts being dimensioned to leave a gap between each adjacent pair of rigid planr skirts in the longitudinal direction of the fence, and no skirt being attached to the end of each of said rigid floats opposite the first end;

c. a flexible membrane attached to each adjacent pair of said rigid planar skirts to close the gap therebetween, whereby said rigid planar skirts and said flexible membranes attached to said rigid floats will form a continuous wall capable of inhibiting floating matter from moving thereacross; and

d. hinge means for pivotally connecting each pair of adjacent floats, each of said hinge means comprising a pair of core metal plates, each of which is connected to one of said adjacent floats adjacent to the hinge axis, reinforcing cords wound around said metal plates and crossing the hinge axis transversely thereto, and a vibration-absorbing elastomeric body surrounding said metal plates and said reinforcing cord, said hinge means being rigid so as to permit relative rotational motion about the hinge axis but to substantially prevent relative rotational motion about axes perpendicular to the hinge axis, whereby each pair of adjacent floats is swingable about an axis therebetween which is substantially perpendicular to the longitudinal direction of the fence, permitting the fence to follow any variation of the wave contour on the water surface, but the fence is restricted from flexing in the longitudinal direction of the fence.

3,962,876

FISHWAY

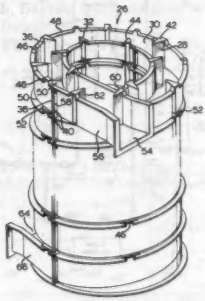
Adrian Phillips, Toronto, Canada, assignor to Aeroceanics Fishways Corporation, Scarborough, Canada

Filed July 15, 1974, Ser. No. 488,380

Claims priority, application United Kingdom, Oct. 6, 1973, 46773/73

Int. Cl.² E02B *8/08*

U.S. Cl. 61—21 **9 Claims**



1. A fishway comprising a channel having spaced-apart side walls and an interconnecting bottom wall for conducting a flow of water therethrough, a plurality of vortex generators formed alternately on the channel side walls a longitudinal distance apart about equal to the channel width by baffles extending from the channel side walls across the channel about one-quarter to about one-half the channel width for providing interconnected reversing vortices in the flow stream of water along the channel, said vortices extending substantially across the channel width, whereby alternately reversing cross-stream water flows and upstream water flows are created, with a minimized downstream flow, to assist fish in upstream travel by use of the said cross-stream and upstream water flows.

3,962,877

OFF-SHORE POWER PLANT

Peter Schiemichen, Hunxe, Germany, assignor to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

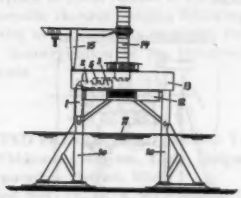
Filed Mar. 6, 1975, Ser. No. 555,898

Claims priority, application Germany, Mar. 16, 1974, 2412662

Int. Cl.² F02C *7/08;* **E02B** *17/00;* **B63B** *35/02*

U.S. Cl. 61—46.5 **9 Claims**

1. An off-shore power plant comprising, in combination, support means for carrying the components of said power plant, and having hollow interior chamber means, steam generator means in said support means; combustion chamber means within said interior chamber means of said support means and having flue gas smokestack means and steam duct means, said combustion chamber means being connected to



said steam generator means and operated at superpressure; gas turbine means connected to said flue gas smokestack means; steam turbine means connected to said steam duct means; platform means carried by said support means and having a plurality of decks, said gas turbine and said steam turbine means being located on one of said decks.

3,962,878

STABILIZATION OF MARITIME STRUCTURES

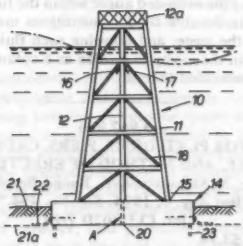
Frode Johan Hansen, Kingswood, England, assignor to Redpath Dorman Long (North Sea) Limited, Bedford, England

Filed July 17, 1974, Ser. No. 489,392

Claims priority, application United Kingdom, July 20, 1973, 34680/73; Oct. 9, 1973, 47095/73

Int. Cl.² E02B *17/00*

U.S. Cl. 61—46.5 **11 Claims**



1. A free standing maritime platform assembly incorporating a foundation raft for founding in water on a sea bed, said raft having underneath it an impermeable base surface, and remote from the edge of that surface an opening, a duct connected between that opening and a reservoir means associated with said platform assembly, and venting means connected to and communicating with the reservoir, said venting means including one way valve means responsive to the movement of waves and capable of permitting the egress of water from the reservoir if the trough of a wave passes over the raft, which one way valve is located at an elevation above said raft and below the lowest mean water level envisaged, whereby pore water pressure at at least one point beneath the raft may be reduced with respect to the hydro-static pressure appropriate to the external depth of water below the mean level of the water in which the raft is to be founded.

3,962,879

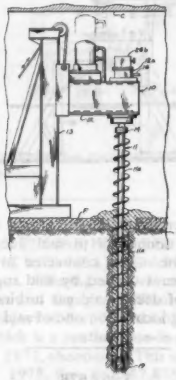
REINFORCED PILE IN EARTH SITUS AND METHOD OF PRODUCING SAME

Lee A. Turzillo, 2078 Glengary Road, Akron, Ohio 44313

Continuation-in-part of Ser. No. 356,760, May 3, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,171

Int. Cl.[2] E02D 5/24

U.S. Cl. 61—53.52 27 Claims



1. A method as for forming a concrete pile or like column in an earth situs, comprising the steps of: drilling a first one of a plurality of relatively short sections of a continuous flight auger in screwing direction into the situs, to form a cavity of correspondingly short axial extent; progressively fixedly attaching additional such auger sections to the upper end of the auger to extend the length thereof, and likewise progressively repeating the drilling operation, thereby to extend the cavity depth by increments to requisite full depth thereof; rotating the extended auger in screwing direction within the full-depth cavity to remove the augered earth outwardly therefrom, while retaining the extended auger within the full depth cavity; feeding self-hardenable fluid cementitious material into the cavity to fill the same; and allowing such fluid cementitious material within the cavity to harden as a columnar body with such auger embedded therein.

3,962,880

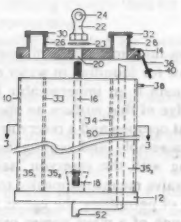
COLUMNS FOR PLATFORMS, PIERS, CAUSEWAYS AND THE LIKE, AND METHOD OF ERECTING SAME

Rud J. Babor, N. Mountain Ave., Bound Brook, N.J. 08805

Filed Aug. 5, 1974, Ser. No. 494,705

Int. Cl.[2] E02D 7/24

U.S. Cl. 61—53.74 6 Claims



4. A supporting column for use in a body of water, comprising

a hollow casing having a central bore closed at one end, and adapted to have said one end embedded in the bottom of a body of water,

at least two spaced partitions each of which extends though and divides said central bore into at least three vertical compartments, each of which extends without interruption between said opposite ends,

a first end cap fixedly secured across one end of said casing and operatively closing said one end of said bore,

a further end cap removably secured over the opposite end of said casing releasably to close the opposite end of said bore,

a duct carried by said casing and extending under said first end cap supplying compressed air beneath said casing,

one of said compartments being disposed centrally of said casing, and

a rigid pillar removably mounted in, and extending between opposite ends of said one compartment, and

said duct having a vertical portion extending through another of said compartments and a horizontal portion extending beneath said first end cap.

3,962,881

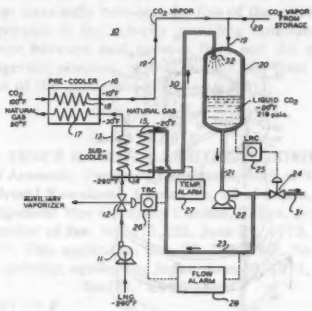
LIQUEFACTION OF A VAPOR UTILIZING REFRIGERATION OF LNG

Allen V. Muska, Berkeley Heights, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Feb. 19, 1974, Ser. No. 443,596

Int. Cl.[2] F25J 1/00

U.S. Cl. 62—9 12 Claims



1. A method of condensing a normally gaseous, cryogenic substance having a boiling point above the boiling point of liquefied natural gas from a vapor phase to a liquid phase comprising the steps of providing said substance in the liquid phase, passing said liquid phase countercurrently in heat exchange relation with liquefied natural gas to sub-cool said liquid phase; introducing the vapor phase of said substance into a condensing vessel; and separately spraying the sub-cooled liquid phase of said substance into said vessel in direct contact with said introduced vapor to condense said vapor to the liquid phase.

3,962,882

METHOD AND APPARATUS FOR TRANSFER OF LIQUEFIED GAS

David E. Gee, Tarporley, and Robert V. Worboys, Chester, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 11, 1974, Ser. No. 505,128

Claims priority, application United Kingdom, July 24, 1974, 35195/73

Int. Cl.[2] F17C 7/02

U.S. Cl. 62—55 5 Claims

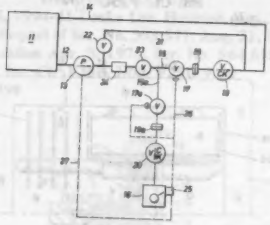
1. A method of transferring a liquefied gas from a first container to a second container without removal of vapor from the second container which comprises the following sequential steps:

a. cooling a multiple part conduit having a disconnectable coupling between two parts thereof by removing liquefied

gas from said first container, pressurizing the removed liquefied gas and returning the pressurized liquefied gas to said first container through said conduit;

b. breaking said conduit at the coupling thereof into first and second parts and establishing communication between said first container and said second container through the first part of the cooled conduit while closing off the second part thereof; and

c. transferring liquefied gas under pressure from said first container to said second container through said first part of said conduit.



3,962,883

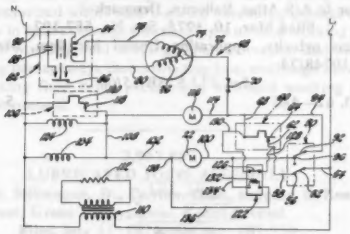
SLAB COMPLETION TIME DELAY RELAY

Robert Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 2, 1975, Ser. No. 592,649

Int. Cl.² F25C *1/12*

U.S. Cl. 62—137 **3 Claims**



1. In an ice maker of the type including a mechanical compressor refrigerant system having a refrigerated surface for ice build up and water circulation means operative during an ice making mode to pass water over the refrigerated surface and further including a hot gas defrost system for directing hot refrigerant gas from the compressor to the surface to remove an ice build up therefrom for collection in a bin, the improvement comprising: first circuit means for energizing the compressor including a bin level control switch; second circuit means for energizing the water pump including said bin level control switch and a normally closed ice thickness sensor switch; third circuit for energizing the hot gas defrost system including said ice thickness sensor switch and operative to maintain the hot gas defrost system off when the ice thickness sensor switch is closed; a thermal relay switch having a bimetallic element and a heater; means including said ice thickness sensor switch for maintaining said heater energized to bias said bimetallic element closed during an ice making mode of operation wherein the bin level switch has detected a maximum ice level in the bin, said closed bimetallic element bypassing said bin level control switch to maintain the compressor and water circulation means operative following a build up of a maximum level of ice in the bin; said ice thickness sensor switch being responsive to a desired ice build up to terminate water circulation and to condition said third circuit means to initiate a defrost cycle of operation; said heater being conditioned during the defrost cycle of operation to reduce heat flow to the closed bimetallic element to produce a time delayed energization of said hot gas defrost system through the element dependent upon the cool down characteristics of said bimetallic element to produce a flow of hot gas across the refrigerated surface to cause release of the ice build up therefrom, said bimetallic element opening following the predetermined time delay to concurrently terminate the defrost cycle and maintain deenergization of the compressor and water circulation means.

3,962,884

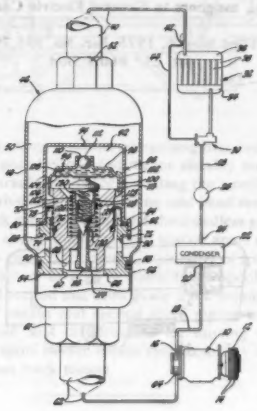
PILOTED FREEZE THROTTLING VALVE

Richard E. Widdowson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,741

Int. Cl.² F25B *41/04*

U.S. Cl. 62—217 **2 Claims**



1. A refrigerant control valve for an air conditioning system including an evaporator and a compressor comprising: an elongated housing defining an interior space and having an inlet and an outlet at either end adapted to be connected respectively to the evaporator and the compressor for fluid flow through the elongated housing; a partition member extending across said interior space between said inlet and outlet and having an aperture therethrough encircled by a valve seat portion of said member; said partition member having an annular wall portion encircling said valve seat portion inward from the peripheral edge of said partition member and extending axially toward the inlet end of the housing; a piston valve reciprocally supported within said annular wall portion of said partition member in coaxial alignment with said inlet, outlet and aperture and having a reduced diameter end portion movable with respect to said valve seat portion of said partition member to control refrigerant flow through said aperture; enclosure-forming means including said partition member and said piston valve defining a pressure control chamber whereby a pressure force on said piston valve is produced to position the valve with respect to said valve seat; said enclosure-forming means having a restricted opening between said control chamber and an upstream portion of said interior space for admitting refrigerant to the control chamber and a bleed passage between said control chamber and a downstream portion of said interior space for discharging refrigerant from said control chamber; a bleed valve operable associated with said bleed passage for controlling refrigerant discharge from said control chamber to regulate the pressure in said control

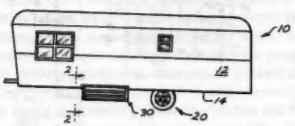
chamber; a temperature responsive sensor-actuator including a housing having a rigid walled portion and a resiliently walled portion with said walled portions closely spaced to define an interior of relatively small volume filled with water whereby ice formation in said interior causes outward movement of said resilient wall with respect to said rigid wall; said sensor-actuator being supported at a peripheral edge of its rigid wall and with said resilient wall adjacent said bleed valve so that movement of said resilient wall caused by ice formation in said sensor interior produces a closing force on said bleed valve whereby the resultant restriction of fluid flow through said bleed passage increases the pressure in said control chamber to produce a pressure force tending to move said piston valve so as to block flow through said aperture in said partition member.

3,962,885

AIR CONDITIONING SYSTEM FOR A MOBILE HOME

Bernard W. Schoenbachler, and Bruce L. Ruark, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 6, 1975, Ser. No. 555,798
Int. Cl.² B60H 3/04
U.S. Cl. 62—239 4 Claims



1. An air conditioning system including a mobile home having at least one zone to be air conditioned and a base structure, having longitudinally extending spaced parallel support beams being located inwardly of the outer walls of said mobile home for providing a support area therebetween, said distribution means being located between said support beams, said system comprising:

an air conditioning unit including a cabinet being adapted to be removably attached to said mobile home, said cabinet including air moving means, air delivery outlet one one of said cabinet side walls and an air return outlet in the top wall of said cabinet;

said air distribution means including at least one air inlet for receiving air from said air conditioning unit and an air outlet for delivering air into said mobile home zone;

mounting means including an adaptor plate attached to said base structure in said support area for removably receiving said air conditioning unit, a plate attached to said adaptor plate being positioned adjacent said air delivery outlet including a first opening in alignment with said air delivery outlet and, a second opening in said adaptor plate in alignment with said air return outlet when said unit is located in said mounting means;

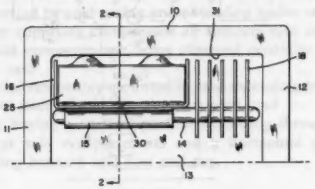
air communicating means including a first passageway extending from said first opening across the lower distal end of said support beam to said air distribution means air inlet, and a second passageway for connecting said second opening with said mobile home zone so that said air moving means recirculates air through said mobile home.

3,962,886

FREEZER ICE TRAY CONSTRUCTION

John Rune Hammar, Spanga, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 5, 1975, Ser. No. 547,266
Claims priority, application Sweden, Feb. 7, 1974, 7401617
Int. Cl.² F25C 1/04
U.S. Cl. 62—340 7 Claims



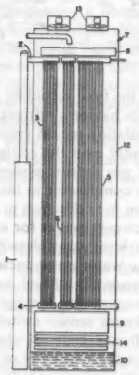
1. The combination of a freezing compartment of a refrigerator and an ice tray therein provided with a cover comprising: said ice tray having a peripheral flange and said cover being provided with a bent edge rear flange for engaging a part of the peripheral flange of said ice tray; said freezing compartment having a floor and a ceiling; and resilient means on said cover projecting upwardly therefrom; the tray, cover and resilient means having such a height dimension that the ceiling and floor of said freezing compartment act to maintain the cover and its bearing surfaces pressed to said peripheral flange of the ice tray.

3,962,887

INDUSTRIAL REFRIGERATION PLANTS OF THE ABSORPTION TYPE

Leon Leopold Breslau Bressendorff, Vanlose, Denmark, assignor to A/S Atlas, Ballerup, Denmark

Filed Mar. 10, 1975, Ser. No. 557,102
Claims priority, application United Kingdom, Mar. 11, 1974, 10748/74
Int. Cl.² F25B 15/00
U.S. Cl. 62—485 5 Claims



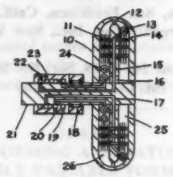
1. In a refrigeration plant of the absorption type comprising a circulation system for refrigerant, a circulation system for absorption liquid and chilled surfaces of the absorber, condenser and additional coolers, said surfaces comprising water-sprinkled tube batteries, the improvement comprising that the tube batteries are arranged vertically and in parallel and com-

prise a common sprinkling system for distributing the water as a film on the outside of the tubes.

3,962,888
HEAT EXCHANGER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 393,571, Aug. 31, 1973. This application Apr. 3, 1975, Ser. No. 564,615
Int. Cl.² F25B 3/00; F25D 9/00
U.S. Cl. 62—499 **3 Claims**

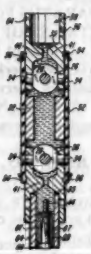


1. In a rotor wherein a working fluid is pressurized by centrifugal force in a set of outward extending passageways, and wherein said working fluid is expanded within a set of inward extending passageways with an accompanying pressure decrease, with said outward extending passageways extending away from a center of rotation of said rotor, and with said inward extending passageways extending inward toward the center of rotation of said rotor, with said outward extending and said inward extending passageways being in communication via passages at their outward ends to allow said working fluid to circulate, the improvement comprising a working fluid heat exchanger placed within said rotor to be in heat exchange relationship with said working fluid while said working fluid is being pressurized within said outward extending passageways, and to be in heat exchange relationship with said working fluid while said working fluid is being expanded within said inward extending passageways thus providing heat exchange between said working fluid being pressurized and said working fluid being compressed.

3,962,889
LUBRICATED JOINT ASSEMBLY

George B. Stillwagon, Jr., Dayton, Ohio, assignor to Kenneth G. Fraser, Green Valley, Ariz., a part interest

Filed July 11, 1974, Ser. No. 487,720
Int. Cl.² F16D 3/84
U.S. Cl. 64—32 F **12 Claims**

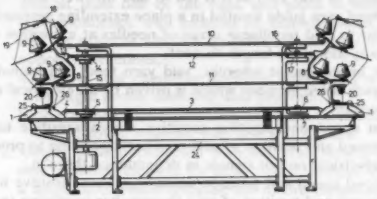


1. In a lubricated joint assembly of the type comprising a torque transmitting joint mechanism enclosed by boot means containing a lubricant, said boot means sealingly engaged to said joint mechanism, the improvements wherein said boot means comprises an elastic material, wherein said lubricant supports said boot means in an expanded condition whereby said boot means compresses said lubricant, and wherein no substantial amount of gas resides in said boot means.

3,962,890
STRAIGHT KNITTING MACHINE COMPRISING ROTATING SLIDING HEADS

Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Aalen, Germany

Filed Mar. 5, 1975, Ser. No. 555,903
Claims priority, application Germany, May 13, 1974, 2423043; Nov. 29, 1974, 2456557
Int. Cl.² D04B 7/04
U.S. Cl. 66—64 **9 Claims**

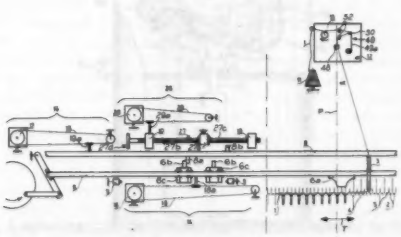


1. A straight knitting machine comprising first endless guide track means, a plurality of head means slidably mounted on said first guide track means for actuating the needles of said machine, first drive means for rotating said head means about said endless track means, second and third endless guide track means disposed above and in parallel spaced apart relation to said first endless guide track means, a plurality of spool holder means each adapted to hold a plurality of spools slidably mounted on said second and third guide track means adjacent respective head means and second drive means operatively connected to said first drive means for moving said head means and said spool holder means synchronously in parallel about said endless track means.

3,962,891
KNITTING MACHINE

Guy Charles Rouzaud, Chatenay-Malabry, France, assignor to Centre Technique Industriel dit: Institut Textile de France, Boulogne-sur-Seine and Societe Anonyme dite: Jaeger, Levallois-Perret, both of, France

Filed Mar. 20, 1975, Ser. No. 560,223
Int. Cl.² D04B 15/48, 15/50
U.S. Cl. 66—132 R **20 Claims**



1. For a knitting machine of the type comprising a rectilinear array of needles,
gathering and shaping sinkers for forming stitches in cooperation with said needles,
a cam bar carrying a cam for actuation of said gathering sinkers,

drive means driving said cam bar to reciprocate longitudinally of said rectilinear array of needles,

a thrower bar carrying a thrower which guides the yarn onto the needles in said rectilinear array thereof, and

means drivingly interlinking said cam bar and said thrower bar;

a yarn supply device operating to supply yarn to said thrower for feeding to said needles at a rate depending on the required stitch size, said yarn supply device comprising:

a yarn spool holding a supply of yarn to be knitted by said machine,

a yarn feed unit for drawing yarn from said spool and driving it towards said thrower,

a yarn take-up device for accommodating a temporary slack loop in said yarn as it is fed to said thrower, and

a fixed yarn guide located in a plane extending perpendicular to said rectilinear array of needles at a position midway along the length thereof,

the improvement wherein, said yarn feed unit includes a yarn drive member which is driven by an electrical drive system,

first speed and position sensitive means sensitive to the speed and position of said cam bar, operating to produce electrical output signals in dependence thereon,

second speed and position sensitive means sensitive to the speed and position of said thrower bar operating to produce electrical output signals in dependence thereon, and

electrical control means connected to the outputs of said first and second speed and position sensitive means and operating to control said drive member of said yarn feed unit, whereby said yarn is fed in dependence on both the speed and position of both said cam bar and said thrower bar.

3,962,892

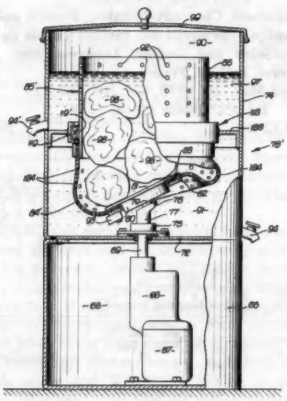
MACHINE FOR CONTROLLED CONDITIONING OF LIQUIDS AND MIXTURES

Leslie H. Garlinghouse, 1585 Sierra Madre Villa, Pasadena, Calif. 91107

Filed May 29, 1973, Ser. No. 364,881

Int. Cl.² D06F *35/00*

U.S. Cl. 68—23 R **9 Claims**



1. A conditioner for liquid-like charges comprising a frame, a closed housing on the frame, a composite container for said charges comprising a lower flexible section located within said housing and an upper rigid section, a wobble plate mounted on the bottom of the flexible section, a wobble drive rotatably journaled in a lower wall of said housing and having a driving relationship with said wobble plate, a motor on said frame at a location below said housing, said motor having a driving connection with the wobble drive whereby to impart an oscillatory motion to the flexible section and liquid-like charge therein, both the lower flexible section and the upper rigid section being within the housing and a partition separating the interior of the housing into a lower chamber surrounding the flexible section and an upper chamber surrounding the rigid section.

3,962,893

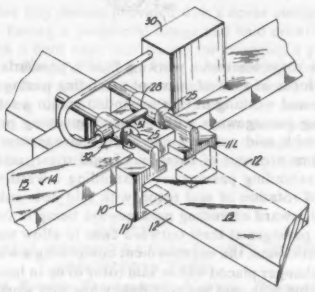
SAFETY SKI LOCK

Roger G. Anderson, San Francisco, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 16, 1975, Ser. No. 587,307

Int. Cl.² E05B *73/00*

U.S. Cl. 70—19 **3 Claims**



1. A device for latching a pair of skis in crossed relation to each other comprising

a pair of clamp members, each shaped to fit about one edge of a first ski and over a portion of the top and bottom surfaces of said first ski,

each said clamp member formed of two U-shaped sections joined together by a bar, said bar located so as to fit over a second ski resting in crossed relation to a first ski engaged by the clamp member, together

with locking means for engaging a pair of clamp members in place.

3,962,894

METHOD OF AND APPARATUS FOR STRETCHING A METAL STRIP

Oskar Noe, and Herbert Lux, both of Mulheim (Ruhr), Germany, assignors to BWG Bergwerk-und Walzwerk Maschinenbau G.m.b.H., Duisburg, Germany

Filed May 29, 1975, Ser. No. 581,767

Claims priority, application Germany, Aug. 16, 1974, 2439260

Int. Cl.² B21D *1/05, 1/02*

U.S. Cl. 72—19 **12 Claims**

1. An apparatus for stretching a continuously displaced elongated metal strip, said apparatus comprising:

a pair of spaced-apart frames;

at least two rollers mounted on each of said frames, said strip being spanned over all of said rollers;

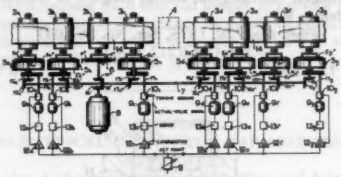
a plurality of three-part differential gear assemblies each having a first part connected to a respective roller;

a drive motor;

a drive shaft operatively connected between the second parts of all of said gear assemblies and said drive motor;

a plurality of compensating motors each operatively con-

nected to the third part of a respective assembly; and



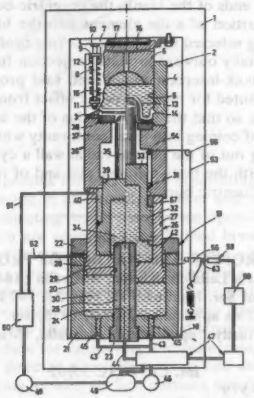
a plurality of control means each connected to a respective compensating motor for operating same so that it applies a predetermined torque to the respective third part.

3,962,895

FLUID FORMING APPARATUS HAVING CONTROLLABLY VARIABLE FORMING PRESSURE

Nils Folke Rydell, Molndal, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Dec. 4, 1974, Ser. No. 529,502
Claims priority, application Sweden, Dec. 5, 1973, 7316381
Int. Cl.[2] B21D 22/12
U.S. Cl. 72—63 8 Claims



1. A fluid forming apparatus having a forming tool comprising a pair of rigid tool parts that are movable in opposite directions, a piston element for each tool part, a cylinder for each piston element, and means defining a constant-volume pressure cavity in which there is confined a quantity of fluid by which force can be exerted over one face of a sheet metal blank to shape the blank to a configuration determined by the forming tool, and wherein each of the tool parts is constrained to move with its piston element and each piston element cooperates with its cylinder to define a pressure chamber at the side of the piston remote from the pressure cavity means, said apparatus being characterized by:

A. pressure control valve means connected with a source of fluid under pressure and having a connection with the pressure chamber of each of said cylinders, said valve means being responsive to demand value signals

1. to direct fluid from said source to one of said pressure chambers, and thus cause one of said tool parts to be moved in a direction inward of the pressure cavity means with resultant displacement of fluid therein, and

2. to maintain pressure in the other pressure chamber at a value signified by a prevailing demand value signal applied to the valve means, while permitting outflow of fluid from said other pressure chamber, so that movement of the other tool part in the opposite direction, due to displacement of fluid in the pressure cavity means, is yieldingly restrained and fluid in the pressure cavity remains under a pressure determined by the demand value signal; and

B. signal generating means for producing pressure demand value signals to which said valve means can respond and which correspond to the pressures desired in the pressure cavity means from instant to instant during a forming operation as related to the instantaneous relative positions of the forming tool parts and in accordance with a predetermined program of pressure variation, said signal generating means comprising

1. cooperating camming elements, one of which is confined to motion in opposite directions and is connected with at least one of the rigid tool parts to move in correspondence with motions of that rigid tool part, and the other of which is movable transversely to said opposite directions,

a. one of said camming elements comprising a cam having a profile denoting said program,

b. the other of said camming elements comprising a cam follower engaged with said profile, and

2. output means connected with said transversely movable camming element for producing an output having a magnitude which corresponds to the instantaneous position of said transversely movable camming element and which constitutes said demand value signal; and

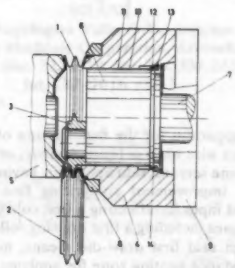
C. means connecting said output means in controlling relation to said valve means.

3,962,896

METHOD OF PRODUCING V-BELT PULLEYS AND SPINNING LATHE FOR CARRYING OUT SUCH METHOD

Joachim H. Bichel, Oeventrop, Germany, assignor to Leifeld & Co., Ahlen, Germany

Filed Nov. 19, 1974, Ser. No. 525,277
Claims priority, application Germany, Nov. 23, 1973, 2358364
Int. Cl.[2] B21D 22/14
U.S. Cl. 72—82 4 Claims



1. A spinning lathe for producing a cylindrical body having at least two V-shaped peripheral grooves comprising a rotary clamping chuck and a rotary backup disc axially movable relative to said clamping chuck for receiving therebetween said body, a shaping roller for grooving the exterior of said body, an eccentrically mounted and axially movable inner roller forming a back-up roller for the shaping roller, and means for mounting said inner roller for movement along the rotary axis of said clamping chuck.

3,962,897

METAL WORKING APPARATUS AND METHODS OF PIERCING

Lewis A. Way, and Robert C. Williams, both of Columbiana, Ohio, assignors to Columbiana Foundry Company, Columbiana, Ohio

Division of Ser. No. 493,234, Oct. 5, 1965, abandoned. This application May 11, 1970, Ser. No. 36,406

Int. Cl.² B21B 17/10

U.S. Cl. 72—209 4 Claims

1. A method of piercing metal members, particularly members containing slag inclusions comprising the steps of urging said member at a temperature above about 1750°F over an as formed cast piercer point by rolling whereby said point passes through and forms an axial opening in the ingot, said point being formed of an alloy consisting essentially of about 0.015% to 2% carbon, about 5% to 65% cobalt, about 15% to 35% chromium and about up to 30% iron.

3,962,898

APPARATUS FOR THE MANUFACTURE OF WIRE

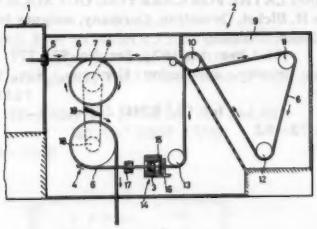
Klaus Erich Tillmann, Herborn, Germany, assignoer to Berkenhoff & Drebes Gesellschaft mit beschrankter Haftung, Herborn, Germany

Filed Apr. 22, 1974, Ser. No. 463,041

Claims priority, application Germany, Apr. 21, 1973, 2320395

Int. Cl.² B21C 1/04

U.S. Cl. 72—279 4 Claims



1. In an apparatus for the manufacture of wire, preferably of nonferrous wire such as brass, tombac, or bronze, for Foudriner machine screens, said apparatus having an input and an output, the improvement comprising first draw-die means adjacent said input for effecting a first cold drawing, said first draw-die means including a first drawing roller for pulling said wire through said first draw-die means, means defining an electric resistance heating zone for applying electrical energy directly to he wire immediately following said first drawing roller, the electrical resistance of said wire effecting a heating of said wire in response to said electrical energy to anneal said wire, second draw-die means for effecting a second cold drawing immediately following said electric resistance heating zone means, said second draw-die means including a second drawing roller for pulling said wire through said second draw-die means; and

coupling means for drivingly coupling said second drawing roller to said first drawing roller, said coupling means having a characteristic of drawing said second drawing roller so that the peripheral speed thereof is higher than the peripheral speed of said first drawing roller.

3,962,899

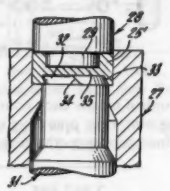
METHOD AND APPARATUS FOR MAKING AN ECCENTRIC LOCKING COLLAR

Henry Hubbell, Southington, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 26, 1975, Ser. No. 562,007

Int. Cl.² B21J 13/02

U.S. Cl. 72—334 18 Claims



1. The method of making an eccentric locking collar for locking a bearing ring or the like to a shaft, which comprises die-forming a blank of coinable metal into a cylindrical body having a central radial wall between opposed axially recessed and outwardly open end bores one of which is characterized generally cylindrical and eccentric and the other of which is concentric to the cylinder, thereby defining projecting body annuli at the ends of the blank, the eccentric-bore formation involving insertion of a die element into the blank, said die element being selected for a blank-working profile characterized by a radially outward arcuate projection fully contained within the blank-insertion region and said projection being angularly oriented for minimal radial offset from the concentric-bore axis, so that the body annulus of the eccentric bore is the result of coining into local conformity with said profile, and punching out of the central radial wall a cylindrical bore concentric with the body-cylinder axis and of radius to clear the coined eccentric bore.

3,962,900

FENCE DROPPER AND METHOD OF PRODUCTION

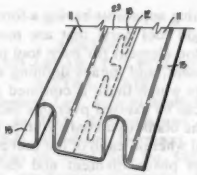
Gordon Francis Leiblich, Kimba, Australia (5641)

Division of Ser. No. 361,993, May 21, 1973, Pat. No. 3,865,349. This application Jan. 3, 1975, Ser. No. 538,367

Claims priority, application Australia, May 23, 1972, 9049/72

Int. Cl.² B21C 37/02

U.S. Cl. 72—379 6 Claims



1. A method of forming a fence dropper having a body portion with a plurality of tongues spaced from one another and lying beyond one edge thereof,

comprising forming a sheet metal blank into two said body portions of similar cross-sectional shape which extend away from a plane and are joined together by a flat bridging web which lies in that plane,

shearing the flat bridging web to simultaneously blank the profiles of said tongues in their flat form, and respective webs joining the roots of the tongues to the body portions such that each tongue is of similar size and shape, and the recess formed between a said tongue and the body por-

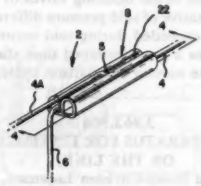
tion from which it is spaced by said root and also between that said tongue and an adjacent said tongue has its size and shape similar to the tongue size and shape,

and then forming each said flat tongue to provide therein a return portion which extends forwardly of but terminates rearwardly of said plane to thereby define with said body portion a wire retaining aperture.

3,962,901
ELECTRICAL CONNECTOR TAP ASSEMBLY APPARATUS

Leslie Alan Anderson; Carmen Achille Cea, and John Maury Gentry, all of Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 399,035, Sept. 20, 1973. This application July 23, 1975, Ser. No. 598,520
Int. Cl.² H01R *43/00*; B21D *9/08*
U.S. Cl. 72—410 **9 Claims**



1. In an apparatus for crimping a connecting device onto each of two wires to electrically connect said wires to each other, said connecting device being of the open-U type having sidewalls which are adapted to be formed inwardly towards each other and into surrounding relationship with said wires, said apparatus being of the type comprising crimping die means and crimping anvil means, said die and anvil means being movable relatively towards and away from each other between open and closed positions, said anvil means having a supporting surface for supporting said connecting device with said sidewalls directed generally towards said die means, said die means having forming surface portions which are opposed to said anvil means, said forming surfaces being adapted to form said sidewalls towards each other and into surrounding relationship to wires located between said die and anvil, a wire receiving slot in said die means extending transversely therein and intersecting said forming surface portions whereby wires can be positioned between said die and anvil means and can extend laterally through said slot intermediate the ends of said die means, a wire shearing member positioned between said die and anvil when said die and anvil are in said open position, said shearing member being movable relatively into said slot to shear wires extending into said slot the improvement to said apparatus comprising:

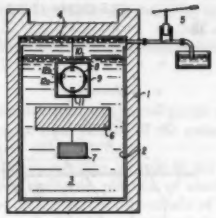
wire clearance means between said shearing member and at least one side of said slot, said clearance means extending generally in the direction of movement of said shearing member into said slot whereby,

the said end of one of said wires can be located in said clearance means and said one wire will not be sheared by said shearing member, and upon crimping said open U-type connecting device onto said wires, said wire will extend continuously into the crimped connecting device and will extend from said connecting device intermediate the ends thereof, and the other one of said wires will be severed and have its end within said connecting device to produce a tap-type electrical connection.

3,962,902
APPARATUS FOR MEASURING VARIATIONS IN FLOATABILITY OF A FLOAT DUE TO VARIATIONS IN PRESSURE

Robert R. Aquilina, Toulon; Robert A. Masson, Carqueiranne, and Norbert A. Jerez, Toulon-Mourillon, all of France, assignors to Etat Francais, represented by Delegation Ministerielle pour l'Armement, France

Filed Sept. 15, 1975, Ser. No. 613,194
Claims priority, application France, Sept. 23, 1974, 74.31947
Int. Cl.² G01N *9/08*
U.S. Cl. 73—37 **11 Claims**



1. An apparatus for measuring variations in floatability of a float with variations in pressure, comprising:

an enclosure which is resistant to high pressures and which is filled with liquid,

means for varying the pressure of said liquid within said enclosure,

a dynamometric ring suspended within said enclosure, said ring comprising a thin elastic blade whose two ends are connected to each other,

strain gauges located substantially vertically on the side faces of the ring,

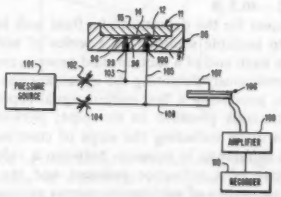
means for suspending a float from said ring,

and noncompressible ballast and means for suspending said ballast from a float suspended from said ring.

3,962,903
METHOD AND SYSTEM FOR SENSING AN IDENTIFYING MEANS

Asad Firdaus, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,263
Int. Cl.² G01B *13/22*
U.S. Cl. 73—37.5 **17 Claims**



1. A system for sensing the location of a slot or the like in a surface of an element but not extending through the element including:

receiving means to receive the element;

said receiving means having a plurality of spaced restrictive openings having spaced portions of the element disposed adjacent thereto when the element is disposed within said receiving means, said receiving means having said restrictive openings disposed in spaced relation from the element disposed within said receiving means;

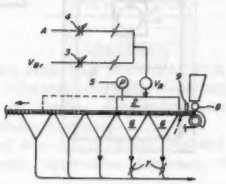
means to supply fluid at the same predetermined pressure along a separate path to each of said openings;

and ascertaining means to ascertain if the slot in the element is located in the surface of one of the portions of the element adjacent to one of said openings through determining the fluid pressure in each of the paths.

3,962,904
PROCESS FOR MEASURING, CONTROLLING AND OPTIMIZING GAS FLOW THROUGH A SINTER MIXTURE ON TRAVELLING GRATES

Alois Kilian, Frankfurt am Main, Germany, assignor to Dravo Corporation, Pittsburgh, Pa.

Filed June 6, 1975, Ser. No. 584,542
Int. Cl.² G01N *15/08*
U.S. Cl. 73—38 **14 Claims**



1. In a sintering process in which hot gases generated in a furnace by ignition of a fuel-air mixture are drawn by windboxes through the ore-mixture as it passes through the furnace on a travelling grate, the steps of:

a. determining the gas pressure in the furnace above the grate,

b. determining the rate of flow of fuel and air to the furnace,

c. adjusting at least one of said flows to maintain the differential between the gas pressure in the furnace above the grate and the pressure outside the furnace at substantially zero, and

d. determining the rate of gas flow through the ore-mixture as a function of said flows.

3,962,905
FLUID LEAK DETECTION PROCESS AND INSTALLATION

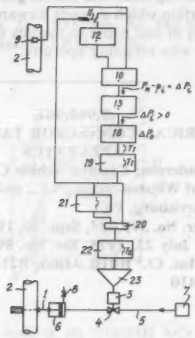
Philippe Jouve, Pontacq, France, assignor to Societe Anonyme dite: Societe Nationale des Gaz du Sud-Ouest, Pau, France

Filed Jan. 6, 1975, Ser. No. 538,565
Claims priority, application France, Jan. 8, 1974, 74.00617
Int. Cl.² G01M *3/28*
U.S. Cl. 73—40.5 R **13 Claims**

1. A process for the detection of a fluid leak in a pipe subdivided into sealable sections by a series of isolating valves arranged at each end of a section, said process comprising the steps of continuously detecting the instantaneous gas pressure in the pipe, producing a first output signal representative of the instantaneous pressure in the pipe; performing a first comparison cycle including the steps of continuously determining the difference in pressure between a reference signal representative of a reference pressure and the first output signal representative of said instantaneous pressure occurring in the pipe; producing a second output signal proportional to said pressure difference when the reference pressure is greater than the instantaneous pressure; comparing said second output signal with a signal representative of a predetermined pressure difference threshold value; producing a third output signal when the value of said second output signal exceeds the value of said signal representative of a predetermined pressure difference threshold value;

establishing a new reference signal representative of the instantaneous pressure in the pipe in response to said third output signal;

performing a second comparison cycle including all of the steps of the first cycle but using the new reference signal for comparison with said first output signal; and

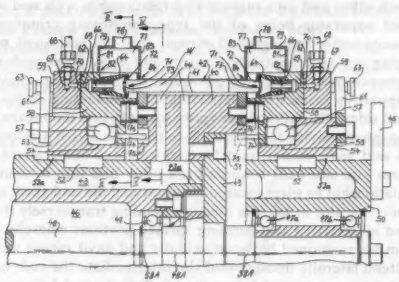


closing at least one of the isolating valves of the pipe if the signal representative of said pressure difference threshold value is again exceeded during said second comparison cycle and within a predetermined time starting from the beginning of the second comparison cycle.

3,962,906
METHOD AND APPARATUS FOR TESTING CIGARETTES OR THE LIKE

Uwe Heitmann, and Heinz-Christen Lorenzen, both of Hamburg, Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Mar. 28, 1974, Ser. No. 455,814
Claims priority, application Germany, Apr. 6, 1973, 2317295
Int. Cl.² G01M *3/26*; G01N *15/08*
U.S. Cl. 73—41 **16 Claims**



1. Apparatus for testing cigarettes or analogous rod-shaped articles wherein an open-ended tubular wrapper surrounds a gas-permeable filler, comprising means for conveying the articles sideways past a testing station, said conveying means comprising a rotary member; means for passing streams of a gaseous testing fluid through the fillers of articles at said testing station whereby at least one characteristic of said streams changes during passage through the fillers of articles having defective fillers and/or wrappers, including (at least one ring-shaped carrier) apertured sealing elements adjacent to one end of each wrapper on said rotary member, said sealing elements being rotatable with said rotary member (about an axis which is inclined with respect to the axis of said rotary member so that successive increments of said carrier), and means for respectively (approach and move) moving said sealing elements toward and away from the neighboring wrap-

per ends during movement of said (increments) sealing elements toward and away from said testing station, (and apertured) said sealing elements (mounted in said carrier) being in register with the respective wrappers on said rotary member and each thereof being arranged to engage the filler at said one end of the registering wrapper during travel past said testing station; means for monitoring said streams to detect the changes in said one characteristic thereof; and sealing means for subjecting the exterior of at least said one end of each wrapper at said testing station to the static pressure of a gaseous sealing fluid to thereby reduce the extent of or to prevent communication between the respective fluid stream and the atmosphere.

3,962,907

VISCOMETER

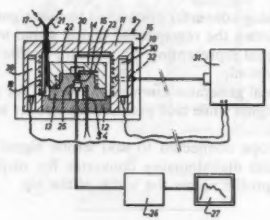
André Peyrouset, Ger, and Roland Prechner, Jurancon, both of France, assignors to Ato Chimie, Courbevoie, France

Filed Apr. 9, 1975, Ser. No. 566,435

Claims priority, application France, Apr. 17, 1974, 74.13281

Int. Cl.² G01N *11/08*

U.S. Cl. 73—55 **6 Claims**



1. A viscometer comprising a metallic block defining a measuring chamber therein, pressure sensitive means in said chamber for sensing pressure variations in said chamber, conversion means for converting pressure variations sensed by said pressure sensitive means into displayable signals, heating means coupled to said block for heating said block to an adjustable predetermined temperature, liquid inlet conduit means connected to said chamber including a first coil within said block and surrounding said chamber, capillary liquid outlet conduit means connected to said chamber and including a second coil within said block and surrounding said chamber, temperature measuring means within said block for measuring the temperature of said block, whereby said temperature measuring means also measures the temperature of liquid in said chamber, and heat insulating means surrounding said block.

3,962,908

TRANSDUCER ARRANGEMENT FOR ULTRASONIC RAIL TESTER COUPLING CARRIAGES

Ivan L. Joy, 415 Delaware Drive, Ozawkie, Kans. 66070

Continuation-in-part of Ser. No. 445,080, Feb. 25, 1974, Pat. No. 3,937,068. This application June 30, 1975, Ser. No. 591,819

Int. Cl.² G01N *29/04*

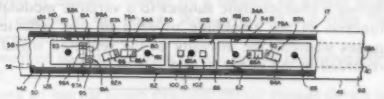
U.S. Cl. 73—67.7 **18 Claims**

1. In an ultrasonic apparatus for progressive railroad track rail flaw testing for detecting flaws in railroad track rails including a multi-element ultrasonic test signal pulse emitting and reverse path echo receiving assembly riding on the rail head in its operative position and comprising a plurality of separate ultrasonic transducer devices mounted in a carriage adapted to be coupled to the rail head in the assembly operative position by means of damping out surface waves on the rail head, through which means the ultrasonic signals are to act, the improvement wherein:

said transducer device comprise:

a first pair of transducer devices positioned for emitting ultrasonic test signal pulses forwardly and rearwardly of the rail along the center line of the rail head in the operative position of the assembly and for receiving reverse path echos of said pulses,

a second pair of transducer devices positioned for emitting ultrasonic test signal pulses forwardly and rearwardly of the rail in the operative position of the assembly and canted in opposite directions at an angle in the range of 12° to 22° with respect to the center line of the



rail, and in the direction of the rail gauge edge and for receiving reverse path echoes of the pulses of the respective second pair of devices,

said transducer devices being located in the assembly to be disposed, in operative position of assembly, at the center of, and on top of, the top surface of the rail head and to act at an angle of incidence relative to the rail head top surface to produce in the rail as a result of their signal impulses ultrasonic waves travelling in the rail at flat angles on the order of 80° to 85° relative to the level of the rail head top surface. With the carriage being coupled to the rail top surface in the operative position of the assembly.

3,962,909

METHOD AND APPARATUS FOR ULTRASONIC EXAMINATION

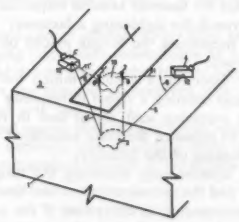
Svend Aage Lund, Birkerod, Denmark, assignor to svejsecentralen Akademiet for De Tekniske Videnskaber, Glostrup, Denmark

Filed Sept. 3, 1974, Ser. No. 502,752

Claims priority, application Denmark, Sept. 5, 1973, 4896/73

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 S **27 Claims**



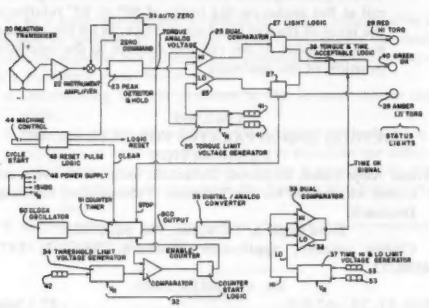
1. A method of indicating, or of recording images of internal inhomogeneities in otherwise homogeneous bodies which have a substantially plane or slightly curved surface by ultrasonic examination according to the pulse echo method, including guiding at least one angle probe connected to an ultrasonic apparatus across the surface of the body to scan its interior by emitting and receiving short-duration ultrasonic pulses in directions that form a predetermined angle with the surface of the body, and activating indicating means in response to received reflected sound pulses to produce punctiform markings on a substantially plane recording surface, characterized by the steps of moving the indicating means having an axis of indication along which the markings on the

recording surface are made to thereby move the axis in the plane of the recording surface in such a way that the displacement of a reference point on the axis of indication in relation to the recording surface follows the two-dimensional displacement of the sound emission point of the probe in relation to the surface of the body on a predetermined scale, the axis of indication in relation to the recording surface following the direction of the projection of the sound path on the surface of the body, each of said markings being effected at a distance from the reference point that is proportional to the time interval that has elasped from the emission to the reception of a sound pulse, detecting the amplitude of each of said returned sound pulses, and simultaneously with each of said distance proportional markings being effected, producing a marking having a characteristic subject to a variable modulation as a function of the amplitude of each of said reflected sound pulses whereby the intensity of the reflected sound pulse is recorded in the image of said inhomogeneity.

3,962,910
METHOD AND APPARATUS FOR FASTENER TENSION INSPECTION

Emanuel G. Spyridakis, Sayre, Pa.; Edwin E. Rice, Ann Arbor, and Robert J. Seccombe, Detroit, both of Mich., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 20, 1973, Ser. No. 389,704
Int. Cl.[2] G01L 5/24
U.S. Cl. 73—88 F **2 Claims**



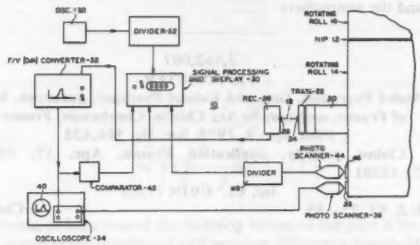
1. Apparatus for fastener tension inspection comprising:
a power wrench for tightening a fastener;
means for measuring the torque placed on the fastener by said wrench;
means for detecting a predetermined low level of initial torque and creating a signal in response thereto;
means for receiving said signal and in response thereto starting to measure the time associated with the continued tightening of the fastener;
means for continuously receiving the torque load on the fastener and the measurement of said time and comparing the measurements to determine if the torque reaches a predetermined magnitude within a predetermined range of time to detect whether a fastening unit is defective.

3,962,911
METHOD AND APPARATUS FOR COUPLING SIGNALS FROM A ROTATING DEVICE WITH END SHAFTS EXPOSED

Wesley E. Grenlund, Clinton, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Nov. 21, 1974, Ser. No. 525,936
Int. Cl.[2] G01B 7/16
U.S. Cl. 73—88.5 R **7 Claims**

2. Apparatus for displaying nip pressure profile information of a roll having a shell and rotating about an axis, comprising:
a pressure transducer connected to the roll shell and operable to produce a first analog signal representing the pressure profile across the width of the nip;
an analog/digital converter connected to said pressure transducer to change said first analog signal to a digital signal;
a digital data transmitter connected to said analog/digital converter to transmit the digital information of said digital signal along a path;
a signal receiver on the path for receiving the digital information and regenerating the digital signal;

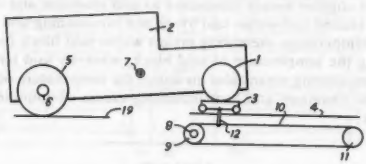


a digital/analog converter connected to said signal receiver for converting the regenerated digital signal to a second analog signal representing the pressure profile across the width of the nip;
a strobe signal generator coupled to the roll for generating a strobe signal while said pressure transducer is in the nip area; and
an oscilloscope connected to said strobe signal generator and to said digital/analog converter for displaying the pressure profile across the width of the nip.

3,962,912
TEST BENCH DEVICE FOR VEHICLES

Jean Borie, 3 U Impasse Bonniot, St. Julien, 13012 Marseille, France

Filed Mar. 19, 1975, Ser. No. 559,748
Claims priority, application France, Mar. 27, 1974, 74.11855
Int. Cl.[2] G01M 17/00
U.S. Cl. 73—117 **4 Claims**



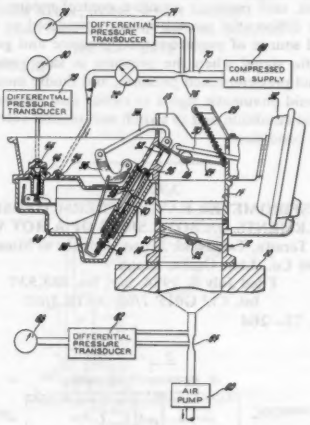
1. A device for testing road vehicles having a pair of road wheels and a gearbox output shaft, said device comprising, in combination:
i. measuring means moving with said vehicle along a flat road surface,
ii. a first pulse transmitter coupled to said measuring means, and a first pulse counter associated with said first pulse transmitter to indicate the distance moved by the vehicle,
iii. second pulse transmitter means coupled to said pair of road wheels of the vehicle, and a second pulse counter associated with said second pulse transmitter means for determining the extent of rotation of said road wheels,
iv. third pulse transmitter means coupled to said gearbox output shaft, and a third pulse counter associated with said third pulse transmitter means, whereby for a given

distance of movement of the vehicle as indicated by the first pulse counter, the second pulse counter indicates the extent of rotation of the road wheels corresponding to that distance of movement, and the third pulse counter indicates the number of rotations of the gearbox output shaft corresponding to said distance of movement and to said extent of rotation of the road wheels.

3,962,913
CARBURETOR CALIBRATION

Partab T. Jeswani, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed June 30, 1975, Ser. No. 591,815
Int. Cl.² G01M *19/00*
U.S. Cl. 73—118 **3 Claims**



1. A method of calibrating a carburetor wherein a metering rod is to be positioned in a fuel jet to provide a predetermined fuel flow rate from the carburetor's fuel bowl to the carburetor's mixture conduit comprising the steps of (1) establishing an air flow through the mixture conduit, and (2) supplying air as a calibration fluid to the fuel bowl at a measured flow rate that is sufficient at a particular metering rod setting to offset the depression of the jet to balance fuel bowl pressure with ambient pressure.

3,962,914
MOTOR VEHICLE BRAKE TEST APPARATUS AND METHOD

Hans Lutz, Ebersbach, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 9, 1975, Ser. No. 621,002
Claims priority, application Germany, Oct. 24, 1974, 2450494
Int. Cl.² G01L *5/28*
U.S. Cl. 73—125 **9 Claims**

1. A brake system test apparatus for motor vehicle brakes comprising:

first and second rollers located in spaced parallel relation for supporting engagement with a wheel on a first side of a motor vehicle to be tested in said apparatus,

third and fourth rollers respectively coaxial with said first and second rollers and located in spaced parallel relation for supporting engagement with a wheel on a second side of said vehicle;

inertial rotary dynamic energy storage means for a magnitude suitable for simulating the dynamic energy of rolling vehicle moving at a speed substantially corresponding to the rotary speed of one of said wheels;

clutch means for coupling and decoupling said rotary energy storage means respectively with and from said third roller;

first rotary force measuring means interposed in a driving connection between said third roller and said rotary energy storage means;

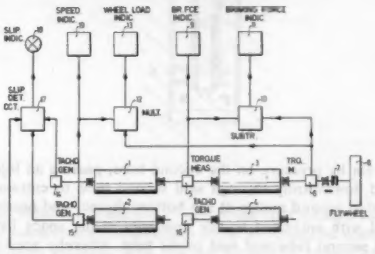
second rotary force measuring means interposed in a driving connection between said first and third rollers, and

means responsive to said first and second force measuring means for separately indicating the braking force applied to each of said wheels,

whereby the braking system of a motor vehicle can be tested with the use of the vehicle's own engine as the principal source of dynamic energy by a transfer of energy from said engine to the energy storage means and from the energy storage means to the vehicle wheels.

7. A method of testing motor vehicle brakes comprising the steps of:

coupling an inertial rotary dynamic energy storage device to rollers arranged to engage a substantially coaxial pair of motor vehicle wheels;



engaging a driven coaxial pair of motor vehicle wheels with said rollers and driving said pair of wheels to store at least a predetermined amount of dynamic energy in said energy storage device;

braking said pair of wheels against the force provided by energy delivered from said energy storage device while measuring the braking force applied to each of said wheels;

again driving said driven pair of wheels to store at least said predetermined amount of energy in said energy storage device;

uncoupling said energy storage device from said rollers and then bringing said rollers substantially to a stop;

removing said driven pair of wheels from engagement with said rollers and bringing an undriven pair of wheels into engagement with said rollers;

recoupling said energy storage device with said rollers, and

braking said undriven pair of wheels while measuring the braking force applied to each of the wheels of said undriven pair.

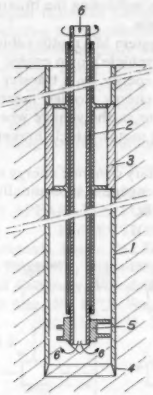
3,962,915
METHOD OF POSITIONING APPARATUSES FOR MEASURING SOIL CONDITIONS

Jean-Francois Jezequel, Binic, France, assignor to Etat Francais, Paris, France

Continuation of Ser. No. 396,176, Sept. 11, 1973, abandoned.
This application Feb. 21, 1975, Ser. No. 551,974
Claims priority, application France, Sept. 15, 1972, 72.33388
Int. Cl.² E21B *49/00*
U.S. Cl. 73—151 **1 Claim**

1. A method for positioning apparatuses for measuring ground conditions below the surface thereof comprising mounting a plurality of measuring apparatuses on a cylindrical probe tube so that said measuring apparatuses form an inter-

mediate portion of the cylindrical wall thereof while maintaining a longitudinal central opening therein for fixedly receiving a second guide tube in spaced relation in the central opening, said probe tube having fragmentation means at the bottom of and coextensive with the cylindrical wall thereof, the lower end of said second tube being above the bottom end of said probe tube, driving the cylindrical probe tube vertically into the ground until the measuring apparatuses are embedded



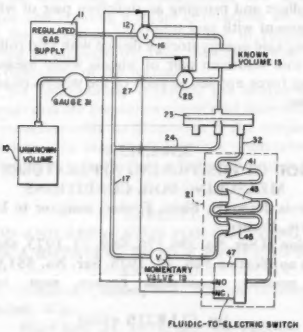
therein by pressure on the second tube, passing an injection fluid downwardly through said second tube to entrain fragmented ground matter at the bottom thereof and passing the fluid with entrained matter upwardly in the space between said second tube and said probe tube, whereby appropriate measurements can be taken in the undisturbed ground surrounding said probe tube which remains in contact with the outer wall of said cylindrical probe tube and said measuring apparatuses.

3,962,916

SYSTEM FOR THE MEASUREMENT OF A CLOSED AIR SPACE

Jean C. Bouchy, and Theodore J. Hardman, both of Cincinnati, Ohio, assignors to McNay Equipment Company, Inc., Cincinnati, Ohio

Filed Jan. 23, 1974, Ser. No. 435,667
Int. Cl.² G01F *17/00*
U.S. Cl. 73—149 **2 Claims**



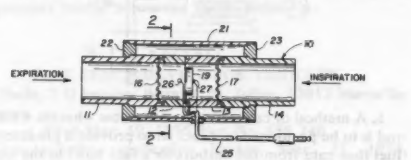
1. A system for measuring an unknown volume comprising a source of predetermined pressure, a vessel of predetermined volume, first valve means having an open condition and a shut condition and being operable to provide a first fluid connection between said source of predetermined pressure and said vessel in said open condition and to interrupt said first fluid connection in said shut condition, second valve means having an open condition and a shut condition and being operable in said open condition to provide a second fluid connection between said vessel and the unknown volume to be measured and to interrupt said second fluid connection in said shut condition, control means for initially setting said first valve means in an open condition and said second valve means in its shut condition and being responsive to the pressure in said vessel and to the said predetermined pressure to switch said said first valve means to its shut condition and switch said second valve means to its open condition in response to the pressure in said vessel becoming equal to said predetermined pressure, and gauge means for measuring the pressure in said unknown vessel when said second valve means is in said open condition, said pressure sensitive control means comprising pressure differential sensing means connected to said vessel and said source of predetermined pressure and generating a pneumatic signal when the pressure in said vessel rises to equal said predetermined pressure, and fluidic means responsive to said pneumatic signal to switch said first valve means to its shut condition and to switch said second valve means to its open condition.

3,962,917

RESPIROMETER HAVING THERMOSENSITIVE ELEMENTS ON BOTH SIDES OF A HOT WIRE

Hideshi Terada, Takatsuki, Japan, assignor to Minato Medical Science Co., Ltd., Osaka, Japan

Filed July 3, 1974, Ser. No. 485,537
Int. Cl.² G01F *1/68*; A61B *5/08*
U.S. Cl. 73—204 **10 Claims**



1. A respirometer for use in measuring the rate of an air flow of respiration, comprising:

means for defining a one-dimensional path of air flow of respiration;

a hot wire in said respiration air flow path;

means coupled to said hot wire for maintaining said hot wire substantially at a predetermined temperature;

a pair of temperature sensitive elements in said respiration air flow path on respective opposite sides of said hot wire relative to the air flow of respiration in said air flow path, said temperature sensitive elements having an electrical characteristic which varies as a function of temperature;

first means electrically connected to said hot wire for producing an electrical output signal representative of the rate of said air flow but without discriminating between the senses of the direction of said air flow; and

second means electrically connected to said first means and to said temperature sensitive elements, said second means including:

third means electrically connected to said temperature sensitive elements for producing a control signal that assumes a first value during expiration and a second value during inspiration; and

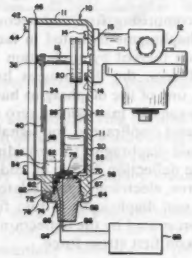
fourth means electrically connected to said first and third means and including: switching means responsive to said control signal; first electrical operating means coupled to said switching means and having a first electrical characteristic for operating on said electrical

output signal of said first means during inspiration for providing an inspiration output signal; second electrical operating means coupled to said switching means and having a second electrical characteristic for operating on said electrical output signal of said first means during expiration for providing an expiration output signal, and combining means coupled to said first and second electrical operating means for combining the inspiration and expiration output signals thereof and producing a respiration rate signal representative of the rate of said air flow with discrimination between the senses of the direction of said air flow.

3,962,918
FLOW INDICATOR WITH WEIGHT BIASING MEANS

Nils O. Rosaen, Bloomfield Hills, Mich., assignor to Nancy Rosaen, Ann Arbor, Mich., a part interest

Filed Nov. 15, 1974, Ser. No. 523,999
Int. Cl.² G01F 1/28
U.S. Cl. 73—228 1 Claim

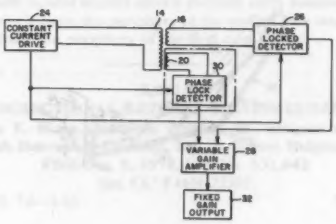


1. A fluid flow meter adapted to provide a visual indication of the fluid flow rate through said flow meter, said flow meter having a housing and being of the type which imparts a rotation to a shaft in response to a variation in the flow rate through said flow meter, said flow meter further comprising indicator means operably connected to said shaft and adapted to give a visual indication of the rotational position of said shaft; means biasing said shaft in a direction opposite to that produced by fluid flow through said flow meter, said biasing means comprising a pulley mounted on said shaft; a weight, and an elongated flexible member having one end secured to said pulley and the other end secured to said weight, the length of said flexible member being such that said weight is suspended by said flexible member through substantially the entire fluid flow range of said indicator means, a channel guide secured to said housing and adapted to receive the weight therein to guide said weight along a substantially vertical axis, and an electrical switch disposed on a plug, said plug being removably mounted in a bore in said housing at the base of said channel guide and including an abutment surface which cooperates with an abutment surface in said bore to thereby vertically position said plug, and wherein said switch further comprises a first resilient contact and a second contact, said contacts having at least a portion of each contact in vertical alignment with the other, wherein at least one of said contacts is disposed under said weight so that said weight engages said last mentioned contact at the lowermost vertical position of said weight and depresses said last mentioned contact to thereby actuate said switch.

3,962,919
TEMPERATURE COMPENSATED INDUCTIVE LIQUID METAL LEVEL DETECTION SYSTEM

Kerwin C. Playfoot, Horseheads, and William H. Todt, Elmira Heights, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 15, 1975, Ser. No. 596,140
Int. Cl.² G01F 23/26
U.S. Cl. 73—290 R 5 Claims



1. An inductive liquid metal level probe comprising a bifilar wound transformer coil wrapped about an elongated conductive support mandrel, with the coil formed of coaxial cable with the outer sheath electrically connected to the conductive support mandrel, and wherein a temperature compensation coil is disposed about at least one end of the support mandrel and is inductively coupled to the primary of the bifilar wound transformer, with the temperature compensation coil formed of coaxial cable with the outer sheath electrically connected to the support mandrel.

4. An inductive liquid metal level detection system comprising:

a. an inductive probe which is insertable into a sealed tube which is disposed in the depth direction in the liquid metal chamber, which probe comprises a bifilar wound transformer wrapped about an elongated tubular support mandrel, with a temperature compensation coil disposed about at least about one end of the support mandrel and inductively coupled to the primary of the bifilar wound transformer coil;

b. a constant current power supply electrically connected to the primary coil of the bifilar wound transformer coil, the secondary coil of the bifilar wound transformer and the temperature compensation coil are connected to an amplifier means, with the primary coil producing an induced output voltage signal across the secondary coil which is a function of the number of turns of the secondary coil which are effectively short circuited by the presence of liquid metal about the sealed tube within which the probe is disposed, and wherein the induced voltage across the temperature compensation coil varies as a function of the ambient temperature about the temperature compensation coil to provide a temperature indicative output signal,

c. amplifier means electrically connected to the secondary coil and the temperature compensation coil with the respective output signals of these coils applied to the amplifier means to generate a temperature compensated output signal which is indicative of the depth of the liquid metal about the probe.

3,962,920

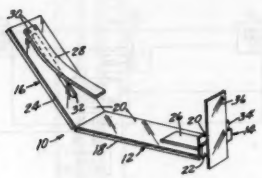
RESERVOIR PAD FOR TIME INDICATOR

Wendell J. Manske, Birchwood Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 404,891, Oct. 10, 1973, Pat. No. 3,954,011, which is a continuation-in-part of Ser. No. 400,044, Sept. 24, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 553,003

Int. Cl.² G04F 13/00; G01K 11/12

U.S. Cl. 73—356 10 Claims



1. An indicating device comprising, in combination,

a base sheet having first and second ends;

a liquid impervious film adhered to a first major surface of said base sheet;

a porous reservoir pad contacting said film and located proximate said first end of said base sheet, said pad containing an indicating material and including means for containing and presenting a controlled amount of liquid to a wick in contact therewith, and including means for selectively limiting the maximum migration rate for a given liquid below the migration rate provided by a free pool of the liquid;

a cover overlying and substantialy coextensive with said base sheet, said cover comprising first and second abutting cover sheet portions with said first cover sheet portion extending from said first end of said base sheet and having its edge abutting said second cover sheet portion transverse of said reservoir pad, and said second cover sheet portion extending to said second end of said base sheet and having a viewing window therein;

a liquid impervious film adhered to the inner surfaces of said cover sheets and connecting said cover sheets to the film-covered base sheet;

a protective strip comprising liquid impervious film underlying the abutting edges of said first and second cover sheet portions and interposed between said reservoir pad and the abutting edges on said first and second cover sheet portions to protect the adjacent edges of said first and second cover sheet portions from the indicating material in the reservoir pad;

a wick adhered to said second cover sheet portion and contained between said second cover sheet portion and said base sheet, at least a portion of said wick being visible through the window in said second cover sheet portion and at least a portion of said wick lapping at least a portion of said reservoir pad;

the sides of the cover sheet and base sheet being sealed together to bias said wick toward said pad; and

a liquid impervious activating strip having one end portion positioned between and covering the adjacent surface portions of said wick and said reservoir pad, and having its opposite end portion extending from said cover sheet to afford manual engagement to pull said activating strip from between said pad and wick and allow migration of said indicating material into said wick.

3,962,921

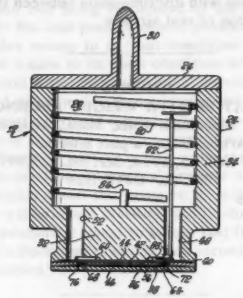
COMPENSATED PRESSURE TRANSDUCER

Donald C. Lips, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 223,462, Feb. 4, 1972, abandoned. This application Sept. 7, 1973, Ser. No. 395,320

Int. Cl.² G01L 9/12

U.S. Cl. 73—398 C 13 Claims



1. A transducer comprising first and second stress force sensing deflection diaphragms mounted in face-to-face relationship for deflection thereof by application thereto of first and second stress forces, the diaphragms having edges in sealing engagement, one of the diaphragms having a recessed deflection surface; means for maintaining zero pressure differential across one of said diaphragms; and signal means electrically coupled with said diaphragms for providing an electrical output related to the deflection of one of said diaphragms to said second stress force, electrical output related to the deflection of said one of said diaphragms to said first stress force being substantially prevented by the deflection of the other of said diaphragms to said first stress force.

3,962,922

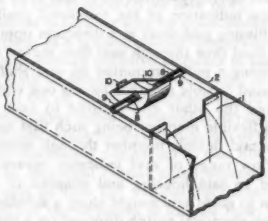
SAMPLING APPARATUS FOR FLUID

Kazuhiko Takeuchi, Fujisawa, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 30, 1975, Ser. No. 545,545

Int. Cl.² G01N 1/00

U.S. Cl. 73—424 1 Claim



1. A sampling apparatus for sampling a fluid flowing in an open aqueduct provided with a notched weir in which the relation $F=f(h)$ prevails where F is the volume flow rate and h is the height of fluid level above the bottom of the notch in the weir; the improvement comprising:

a rotatable sampling scoop means,

means for supporting said sampling scoop means on an axis of rotation positioned a predetermined distance above the level of the bottom of the notch in said weir and on the upstream side of said weir,

said sampling scoop means having a forward edge at a distance from said axis of rotation equal to the distance from said axis of rotation above the level of the bottom of said notch in said weir,

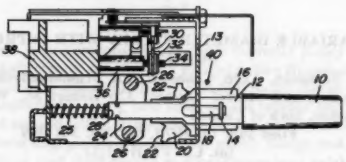
said sampling scoop means being configured to satisfy the relation $Q = k \cdot F$, where Q is the quantity of fluid in a sample obtained by said sampling scoop means when said scoop means is rotated about said axis, k is a proportionality constant and F is the volume flow rate.

3,962,923

FORCE DIRECTED KEYSLIDE CAM

Alfred Ray Harlan, Garland, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1974, Ser. No. 537,727
Int. Cl.² F16H *35/18*
U.S. Cl. 74—10.33 **6 Claims**



1. A tuning mechanism for a pushbutton radio including a combination;

a treadle bar assembly having parallel rods constrained to rotate about an axis, each rod having an engaging surface,

a cam provided with engaging faces,

a directionally movable coupling means coupling the cam faces to the rod surfaces,

the faces and surfaces of predetermined shape

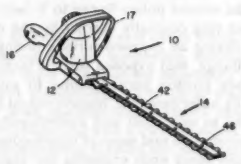
whereby the point of contact of a rod surface with a cam face is substantially within a plane parallel to the plane of movement of the coupling means and extending through the axial center of the rod.

3,962,924

DOUBLE CAM DRIVE FOR A HEDGE TRIMMER HAVING TWO RECIPROCATING CUTTING BLADES

Richard Warmath Glover, Joppa, and Edward Joseph Oldewurtel, Columbia, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Division of Ser. No. 463,749, April 24, 1974, Pat. No. 3,897,630. This application Jan. 10, 1975, Ser. No. 539,971
Int. Cl.² F16H *21/18*
U.S. Cl. 74—50 **7 Claims**



1. An apparatus for simultaneously imparting relative motion to two juxtapositioned driven members comprising:

support means;

first and second driven members having yokes defining cam follower slots, said driven members being carried by said support means for relative movement in a plane with respect to each other with the cam follower slots being held in juxtapositioned relationship with respect to each other;

drive means rotatable about an axis normal to the plane of relative movement;

first cam means mounted upon the drive means, the periphery of said first cam means engaging the cam follower slot on the first driven member and operable to impart relative movement to said first driven member upon rotation of the drive means, the axis of rotation of said drive means passing within the periphery of the first cam means; and

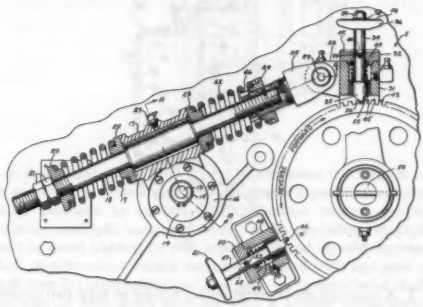
second cam means integral with and laterally off-set from the first cam means, the periphery of said second cam means engaging the cam follower slot on the second driven member and operable to impart relative movement to said second driven member upon rotation of said drive means, the periphery of the second cam means lying within the periphery of the first cam means.

3,962,925

BI-DIRECTIONAL RATCHET DRIVE MECHANISM

George E. Olson, Arlington Heights, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Dec. 9, 1974, Ser. No. 531,042
Int. Cl.² F16H *27/02*
U.S. Cl. 74—143 **3 Claims**



1. A ratchet drive mechanism including a motor for rotating an arm or the like in a forward or reverse direction or disconnected therefrom to dispose the arm or the like in a non-rotating position, which comprises a pawl housing adapted to be reciprocated, a shaft extending through the pawl housing, a pawl secured to the lower end of said shaft and the shaft being free to be lifted and rotated within the pawl housing, a transmission housing, an eccentric disc located in the transmission housing and rotated by said motor, a collar secured to the eccentric disc and reciprocated intermittently thereby, a rod extending through the collar and pivoted at one end to the pawl housing, springs assembled on the rod on opposite sides of said collar, abutments secured to said rod and engaged by said springs to effect reciprocation of the rod upon intermittent movement of the collar on the rod to thereby reciprocate the pawl housing and the pawl carried thereby, a ratchet having a plurality of teeth on the outside circumference with the teeth being engaged by the pawl to rotate the ratchet intermittently as the pawl is reciprocated, means connecting the ratchet to said arm to rotate the arm, a spring surrounding the pawl shaft, abutment means confining the spring at opposite ends within the pawl housing to spring plunger the pawl into engagement with the ratchet, means on the outer end of the pawl shaft to lift the pawl shaft outwardly against the tension of the spring and rotate said shaft, a relatively deep slot provided in the outer portion of the abutment means, a generally shallow slot extending in the outer portion of the abutment means above the deep slot at an angle of 90° to said

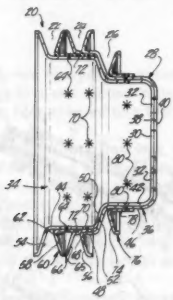
deep slot, a pin adapted to be lodged in the deep slot and extended through the pawl shaft to hold the pawl in engagement with the ratchet to rotate the ratchet in a forward direction upon reciprocation of the pawl and lodged in the deep slot after rotation of the pawl shaft 180° from its initial position and extended through the pawl shaft with the pawl engaging the ratchet to rotate the ratchet in a reverse direction and lodged in the shallow slot 90° from the last position of the pin and extended through the pawl shaft to hold the pawl in a neutral position out of engagement with the ratchet and thereby preventing rotation of said ratchet, and means engaging the ratchet to restrain movement of the ratchet opposite to that in which the ratchet is being driven and adapted to be placed out of engagement with the ratchet when the latter is not being rotated by the driving pawl.

3,962,926

STAMPED SHEET METAL PULLEY

Edward A. Kotlar, 21115 Mack Ave., Grosse Pointe Woods, Mich. 48236

Filed Feb. 3, 1975, Ser. No. 546,615
Int. Cl.² F16H 55/54
U.S. Cl. 74—230.8 **11 Claims**



1. A stamped sheet metal pulley having at least two grooves comprising:

a. a separate one-piece first cup member of stamped sheet metal having a first cylindrical side wall portion, a flat bottom wall portion integral with said first cylindrical side wall portion and extending generally radially inwardly thereof, a second cylindrical side wall portion having a diameter exceeding the diameter of said first cylindrical side wall portion and being axially spaced from said first cylindrical side wall portion, an annular intermediate wall portion integral with, obliquely inclined to, and interconnecting said first and second cylindrical side wall portions and extending continuously generally radially outwardly of said first cylindrical side wall portion, and an annular flange integral with, obliquely inclined to, and extending generally radially outwardly of said second cylindrical side wall portion of said first cup member adjacent the open end of said first cup member;

b. a separate one-piece second cup member of stamped sheet metal having a first cylindrical side wall portion telescopically interengaged with an interference fit over said first cylindrical side wall portion of said first cup member, a flat bottom wall portion integral with said first cylindrical side wall portion of said second cup member and extending generally radially inwardly thereof, and an annular flange integral with, obliquely inclined to, and extending generally radially outwardly of said first cylindrical side wall portion of said second cup member, said cup members being interengaged such that said flat bottom wall portions of said cup members are in abutting co-planar engagement and said annular flanges are spaced apart axially to each define at least in part a groove of the pulley;

c. a plurality of circumferentially equally spaced spot welds in and fixing said first cylindrical side wall portions of said cup members together;

d. at least one mounting hole extending through both of said flat bottom wall portions of said cup members;

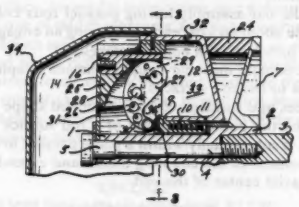
e. a separate one-piece first ring of stamped sheet metal having an obliquely inclined annular flange defining in cooperation with said annular flange of said first cup a groove of the pulley and an integral cylindrical base telescopically interengaged with an interference fit over said second cylindrical side wall portion and fixed thereto by a plurality of circumferentially equally spaced spot welds, said annular flange of said first ring being obliquely inclined to and extending generally radially outwardly of said second cylindrical side wall portion of said first cup member.

3,962,927

VARIABLE DIAMETER PULLEY WITH IMPROVED PUSHER RING

Guy Beaudoin, 1238 Chabanel St., Drummondville South, Quebec, and Marcel Vincent, 320 Hebert St., Wickham, Quebec, both of Canada

Filed Jan. 14, 1975, Ser. No. 541,069
Int. Cl.² F16H 55/52
U.S. Cl. 74—230.17 E **1 Claim**

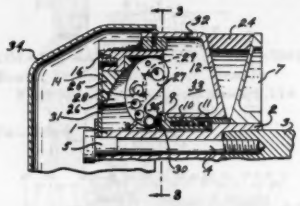


1. A variable diameter pulley comprising an output shaft, first and second conical pulley flanges coaxially mounted on said shaft, a V-belt trained between said two pulley flanges, said first pulley flange secured to said shaft, said second pulley flange axially displaceable on said shaft between a closed position in clutching engagement with said V-belt and an open position releasing and declutching said V-belt, said second pulley flange having a coaxial sleeve extending therefrom away from said first pulley flange, a compression coil spring surrounding said shaft and interposed between said two pulley flanges to urge the second pulley flange to V-belt declutching position, a pusher ring coaxially carried by the outer end of said sleeve and having an exposed surface facing away from said first pulley flange, said exposed surface including a radially inner flat face portion perpendicular to said shaft, followed by a radially outer bevelled, frusto-conical face portion, a support secured to said shaft and centrifugally responsive lever members pivoted on said support intermediate their ends and having radially inner ends engaging the exposed surface of said pusher ring for exerting an axial force thereon in a direction to move said second flange towards V-belt clutching position against the action of said spring, the inner ends of said lever members, during their centrifugally induced progressive pivotal movement, first contacting said bevelled frusto-conical face portion to displace said second pulley flange towards clutching engagement with said V-belt without clutching the same and then contacting said flat face portion to effect clutching engagement with said V-belt.

3,962,928
VARIABLE DIAMETER PULLEY WITH SHIM MEANS COMPENSATING FOR BELT WEAR

Guy Beaudoin, 1238 Chabanel St., Drummondville South, Quebec, and Marcel Vincent, 320 Hebert St., Wickham, Quebec, both of Canada

Filed Jan. 14, 1975, Ser. No. 541,074
Int. Cl.² F16H 55/52
U.S. Cl. 74—230.17 B 1 Claim

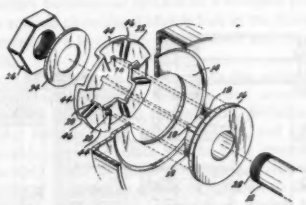


1. A belt wear compensating variable diameter pulley comprising shaft means, a first and a second pulley flanges coaxially mounted on said shaft means, said first pulley flange being axially displaceable along said shaft means toward and away from said second pulley flange, an axial stop provided on said shaft means engageable by said first pulley flange and positioned along said shaft means at a predetermined axial position relative to the pulley flanges and producing a minimum clearance between the latter upon axial engagement by said first pulley flange, and shims removably interposed between said axial stop and said first pulley flange and selectively removable to reduce the spacing between the pulley flanges in relation to the wear of a belt engaging in said spacing.

3,962,929
DRIVE SPROCKET FOR CHAIN SAW

Kay Silvon, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Nov. 24, 1972, Ser. No. 308,971
Int. Cl.² F16H 55/30
U.S. Cl. 74—243 CS 2 Claims

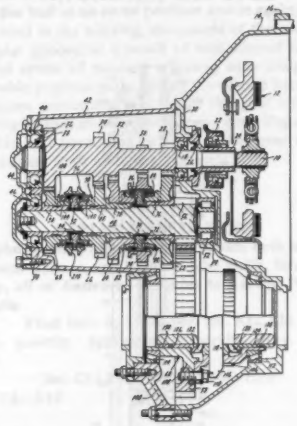


1. A drive sprocket for a saw chain which includes pairs of tie straps having bottom supporting surfaces and interconnected center drive links having depending drive tangs, said drive sprocket comprising; an integral washer like endless metal band with substantially uniform thickness having a circular central opening and a circular outer periphery, wave like flutes symmetrically formed into said metal band radiating outwardly from said central opening and being formed continuously from the inner edge of the band at the central opening to said outer periphery, said flutes forming wall sections alternating between two planar surfaces and web sections transversely spanning the spacing therebetween whereby the peripheral outer edges of the wall sections in one plane are adapted to support said tie straps on one side of a saw chain entrained on said sprocket and the peripheral outer edges of the wall sections in the other plane are adapted to support said tie straps on the other side of the saw chain, and with the transverse web sections adapted to drivingly engage the drive tangs of the center links of the saw chain.

3,962,930
SYNCHRONIZED MANUALLY CONTROLLED MULTIPLE SPEED RATIO TRANSMISSION

William T. Frazee, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1974, Ser. No. 533,370
Int. Cl.² G05G 9/12
U.S. Cl. 74—473 R 2 Claims



1. A multiple speed ratio power transmission mechanism for an automotive vehicle comprising a power input shaft adapted to be clutched to an internal combustion engine, gearing defining multiple torque delivery paths including multiple pairs of gears carried by said input shaft and by said countershaft, synchronizer clutch means associated with one gear of each pair for connecting said one gear to its associated shaft, one pair of said gears meshing with a reverse drive pinion which establishes a geared connection therebetween, said pinion being shiftable into and out of engagement with said last mentioned pair of gears, a differential mechanism, torque output gearing connecting said differential mechanism with said countershaft whereby torque is delievered from said gearing to torque output parts of said differential mechanism, a shift rail mounted in parallel disposition with respect to said input shaft and said countershaft, shift forks carried by said shift rail, one of said shift forks being engageable with said reverse pinion and the other shift forks being engageable with said synchronizer clutch means, said shift forks being mounted slidably on said shift rail, lever means including first and second bellcrank levers for effecting rotary and axial shifting movement of said shift rail, interlock clutch means including drive portions connected to said shift rail and driven portions connected to each of said shift forks whereby said shift forks may be adjusted axially upon axial movement of said shift rail, the driving portions of said interlock clutch means moving into registry with selected ones of said driven portions of said interlock clutch means by rotary adjustment of said shift rail, said linkage mechanism for effecting rotary and axial shifting movement of said shift rail comprising a shift selector shaft mounted on a relatively stationary portion of said mechanism in transverse disposition with respect to said shift rail, said shift selector shaft being adapted for rotary and axial movement, said first bellcrank lever being pivoted on a stationary portion of said mechanism with its operating ends engaged respectively with said shift selector shaft and said shift rail whereby axial movement of said shift lever is translated into

axial movement of said rail, said second bellcrank lever being mounted on a stationary portion of said mechanism with one of its operating ends connected to said shift rail and the other connected to said shift selector shaft whereby rotary motion of said shift selector shaft is translated into rotary motion of said shift rail.

3,962,931

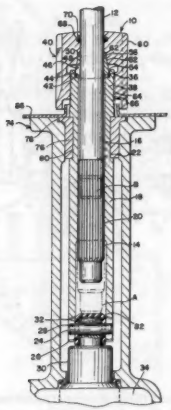
TELESCOPIC STEERING COLUMN

Casimir Moneta, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 21, 1975, Ser. No. 560,905

Int. Cl.² B62D *1/18;* **G05G** *5/22*

U.S. Cl. 74—493 **10 Claims**



1. An adjustable steering column means which comprises:
- a steering shaft having an externally splined lower portion and a smooth upper portion;
- a tube axially and extensibly accommodating said steering shaft having an upper and lower portion and further having internal splines terminating at the upper portion of said tube with a counterbored recess, the upper portion of said tube being externally threaded;
- a steering shaft washer mounted on the recess of said tube that will allow passage therethrough of the smooth portion of said steering shaft and will prevent passage therethrough of the externally splined lower portion of said steering shaft;
- a wedge ring positioned on the top of said steering shaft washer;
- a steering shaft collar formed to allow passage therethrough of said steering shaft and counterbored to accommodate said wedge ring further counterbored and threaded to accommodate the upper portion of said tube.

3,962,932

REACTION MOMENT BALANCING DEVICE FOR AN ENGINE

Yoshinori Okamoto, and Takamasa Onda, both of Kawagoe, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 3, 1975, Ser. No. 610,080

Claims priority, application Japan, Sept. 10, 1974, 49-103455

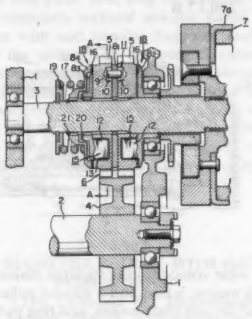
Int. Cl.² F16H *21/22, 55/14;* **F02B** *75/06*

U.S. Cl. 74—604 **4 Claims**

1. A reaction moment balancing device for an engine, comprising:

a balance shaft rotatably supported by the crankcase of the engine in parallel with the engine crankshaft and weighted with a predetermined mass; and

transmission means including a pair of intermeshing driving and driven gears mounted on the crankshaft and the balance shaft, respectively, and having such a gear ratio that the reaction moments exerted on the crankcase by



the rotary systems respectively including the crankshaft and the balance shaft balance with each other;

said transmission means further including:

cushioning means for absorbing shock in gear transmission between the crankshaft and the balance shaft; and

phase-controlling means for limiting the angular phase shift occurring upon operation of said cushioning means within a predetermined range.

3,962,933

DRIVE SYSTEM, PARTICULARLY FOR SHIPS

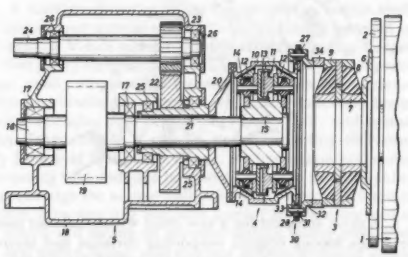
Herbert Wedler, Witten, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 27, 1975, Ser. No. 544,189

Claims priority, application Germany, Feb. 1, 1974, 2405419; Feb. 15, 1974, 2407981

Int. Cl.² F16H *37/06;* **F16D** *3/70, 13/32*

U.S. Cl. 74—665 GA **24 Claims**



1. In a drive system for example for ships having a motor or engine with output shaft, further having a transmission gear with input shaft and being disposed in a casing, there being a clutch interposed between said shafts for causing the input shaft of the gear to be selectively driven from the said output shaft, the clutch having an input element and an output element connected to said input shaft and operating means for selectively connecting the input element of the clutch to the output element thereof, the improvement comprising:

a first coupling having an input element connected to said output shaft and an output element connected to the input element of the first coupling by elastic means;

first means for journalling the clutch input element to said casing to be supported therein;

second means for connecting the clutch input element to the output element of the first coupling; and

one of the first and second means constructed as an additional elastic coupling which includes peripherally distributed elastic elements so that at least the first coupling output element is mounted in cardan suspension fashion by operation of the elastic means of the first coupling and by the elastic elements of said additional coupling.

3,962,934

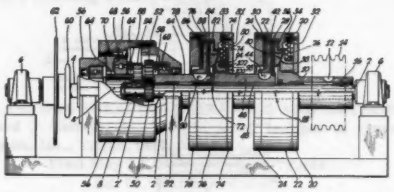
AUTOMATIC VARIABLE SPEED TRANSMISSION

Laurent Boutin, St. Evariste, Quebec, Canada

Filed May 31, 1974, Ser. No. 475,114

Int. Cl.[2] F16H *3/74*

U.S. Cl. 74—752 E **6 Claims**



1. An automatic variable speed air-cooled transmission assembly comprising

a driving shaft and a driven shaft coaxially mounted end to end with an end of the driving shaft being rotatably received within the end of thd driven shaft,

and a first centrifugal clutch hub in the form of a sleeve rotatably carried by the driving shaft, and means to rotate the first centrifugal clutch hub,

and a first centrifugal clutch assembly integrally secured to the first centrifugal clutch hub and rotatable therewith, the first centrifugal clutch assembly comprising a housing and a number of sliding weights held in inner positions by adjustable reaction springs, each sliding weight having a beveled cam surface for wedging contact with a complementary beveled can surface on a movable pressure plate,

and a second centrifugal clutch hub in the form of a sleeve secured by a key to the driving shaft and rotatable therewith,

and a first friction plate secured to the second centrifugal clutch hub extending into the first centrifugal clutch assembly and adjacent the movable pressure plate,

the first friction plate being engaged and driven by the movable pressure plate of the first centrifugal clutch assembly upon the first centrifugal clutch assembly attaining a preselected speed of rotation to thereby effect rotation of the second centrifugal clutch hub and the driving shaft,

and a driving shaft pinion adjacent the said end of the driving shaft,

the driving shaft pinion engaging first pinions of three first and second pinion groups which are equidistantly spaced around and rotatably mounted in a gear carrier,

the first and second pinions of each group being secured together and the second pinions all being in driving engagement with the driven shaft,

and a second centrifugal clutch assembly integrally secured to the second centrifugal clutch hub and rotatable therewith, the second centrifugal clutch assembly comprising a housing and a number of sliding weights held in inner positions by adjustable reaction springs, each sliding weight having a beveled cam surface for wedging contact with a complementary beveled cam surface on a movable pressure plate,

and a second friction plate integrally secured to the gear carrier,

and extending into the second centrifugal clutch assembly and adjacent the movable pressure plate,

the second friction plate being engaged and driven by the movable pressure plate of the second centrifugal clutch assembly upon the second centrifugal clutch assembly attaining a second faster preselected speed of rotation to thereby effect rotation of the gear carrier to achieve a 1:1 driving shaft to driven shaft speed ratio,

each sliding weight in the second centrifugal clutch assembly having a bore parallel with the axis of the driving shaft and a ball carried in the bore and a ball reaction spring nested in the bore acting upon the ball to normally maintain the ball in an outer position and in a circular groove provided in the housing, movement of the ball out of the circular groove as a result of said second faster preselected speed of rotation effecting snap coupling of the movable pressure plate against the second friction plate,

and means preventing rotation of the gear carrier before driving engagement of the second centrifugal clutch assembly and permitting rotation of the gear carrier with the driving shaft after engagement.

3,962,935

VARIABLE SPEED WINCH

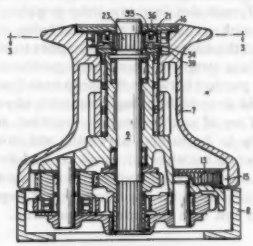
Albert John Hutton; Allen William Hutton, both of Baulkham Hills, near Sydney, and Richard John Dellit, Granville, near Sydney, all of Australia, assignors to Barwin Pty. Limited, Australia

Filed Nov. 8, 1974, Ser. No. 522,123

Claims priority, application Australia, Nov. 12, 1973, 5622/73

Int. Cl.[2] F16H *5/52;* **B66D** *1/30*

U.S. Cl. 74—812 **4 Claims**



1. A winch comprising, in combination, a unidirectional drum rotatable initially by the clockwise motion of a handle in a clockwise sense only, and a gear selector comprising a control plate rotatable with respect to said drum into an extreme clockwise position wherein a first gear ratio is selected, whereby subsequent clockwise rotation of said handle gives the drum a clockwise speed equal to that of the handle, and wherein subsequent anti-clockwise rotation of said handle causes said drum to continue clockwise rotation at an intermediate higher speed with reference to the handle, up to a point where said control plate is urged into an extreme anti-clockwise position with respect to said drum to select a second gear ratio, whereupon the reversal of the handle and subsequent clockwise rotation thereof causes continued clockwise rotation of said drum at a still higher speed with reference to said handle, and wherein reversal of said handle and subsequent further anti-clockwise rotation thereof causes said drum to revert to said intermediate higher speed whilst continuing to rotate clockwise, said gear selector further comprises ratchet means, splined to a shaft rotatable by said handle, whereby clockwise motion of said handle operates a gear train in said first gear ratio via said shaft, but whereby anti-clockwise motion of said handle operates said gear train in said second

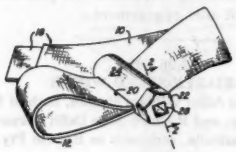
gear ratio via said shaft, said ratchet means being slidable axially with respect to said shaft under the influence of cam means responsive to the relative angular displacement of said handle with respect to said control plate, said control plate has recesses engageable by respective spring-loaded balls captively supported by said ratchet means, and said balls are adapted to enter and lock within said recesses in response to an anti-clockwise rotation of said handle sufficient to cause axial sliding of said ratchet means, with respect to said shaft, under the influence of said cam means whereby said control plate is urged anti-clockwise until said gear train assumes said second gear ratio.

3,962,936

STRAP WRENCH

Wade H. Lewis, Box 3265, Lakeland, Fla. 33802

Filed July 9, 1975, Ser. No. 594,444
Int. Cl.² B25B *13/52*
U.S. Cl. 81—64 **5 Claims**



1. A strap wrench comprising a flexible belt or strap, a rotatable elongated annular fastening-wrenching member having a slot therein passing diametrically through the mid-section and extending from side to side through the annular walls thereof, said slot forming strap gripping edges at each intersection with said annular walls and being sized wider than the combined thicknesses of two strap plies to slidingly receive both ends of the strap and be slidingly positionable thereon to form a bight portion between the strap ends leaving both strap ends free, said strap bight being mountable about and adjusted by the position of said wrenching member to fit about an annular body to be turned herewith, and means upon said fastening-wrench member for receiving and being gripped by the end of a wrench for turning said fastening-wrenching member radially upon its axis into gripping engagement of the edges of said slot with the sides of said strap.

3,962,937

ERROR ADJUSTMENT METHOD AND STRUCTURE FOR LATHES AND THE LIKE

Leo C. Miller, 11110 Dodson Lane, Wheaton, Md. 20902

Filed July 18, 1974, Ser. No. 489,744
Int. Cl.² B23B *25/06, 1/00*
U.S. Cl. 82—1 C **21 Claims**

14. A method for correcting runout and axial errors encountered during rotation of a workpiece about the axis of a lathe or like machine while said workpiece is held by said machine, comprising the steps of:

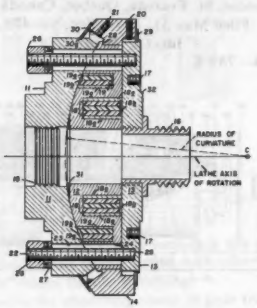
moving the desired axis of rotation of the workpiece substantially radially relative to said axis of rotation of the machine to bring the workpiece axis of rotation into substantial coincidence with said machine axis of rotation at a first selected point within said workpiece substantially at the point along said workpiece where runout error is measured to minimize the runout error at said first selected point, and

subsequently rotating the workpiece axis of rotation substantially about said first selected point to minimize the axial error at a second selected point on said workpiece displaced from said first selected point along the workpiece axis of rotation,

said step of moving the desired axis of rotation of the workpiece radially relative to said axis of rotation of the machine being accomplished without moving relative to said axis of rotation of the machine the point about which the workpiece axis of rotation is subsequently rotated.

17. Apparatus for correcting runout and axial errors enountered during rotation of a workpiece about the axis of a lathe or like machine while said workpiece is held by said machine, comprising:

means for moving the desired axis of rotation of the workpiece substantially radially relative to said axis of rotation of the machine to bring the workpiece axis of rotation into substantial coincidence with said machine axis of



rotation at a first selected point within the spatial volume defined by the workpiece substantially at the point along said workpiece where runout error is measured to minimize the runout error at said first selected point, and

means for subsequently rotating the workpiece axis of rotation substantially about said first selected point to minimize the axial error at a second selected point displaced from said first selected point along the workpiece axis of rotation,

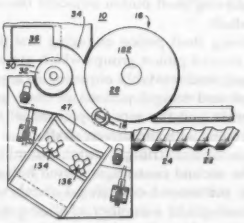
said means for subsequently rotating the workpiece axis of rotation remaining stationary relative to the axis of rotation of said machine while said other means is moving the workpiece axis of rotation radially relative to the axis of rotation of said machine.

3,962,938

METHOD AND APPARATUS IMPROVEMENTS FOR TRIMMING PLASTIC ARTICLES

Joseph R. Reilly, Naugatuck, and Lars G. Schon, Bloomfield, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 472,638, May 23, 1974. This application May 23, 1975, Ser. No. 580,538
Int. Cl.² B23B *1/00, 5/14*
U.S. Cl. 82—47 **3 Claims**



1. In apparatus for trimming moils from plastic articles as they move along a cutting path which includes knife means to

accomplish said trimming, guide means for engaging and transporting each article along said path while in cutting engagement with the knife means, the improvement which comprises:

moil discharge means downstream of the knife means comprising:

i. a rotatably driven moil discharge wheel; and

ii. an anvil opposite said wheel forming a discharge path with said wheel curving away from said cutting path.

2. In the process of removing a moil from the neck of a plastic article which comprises cutting through the moil while the article and moil are vertically positioned and rolling forwardly about a longitudinal axis, the improvement which comprises:

A. engaging said moil after said cutting with the surfaces of a revolving discharge wheel and a supporting anvil; and

B. conveying said engaged moil along a path away from that taken during said forward rolling movement by means of said revolving wheel.

3,962,939

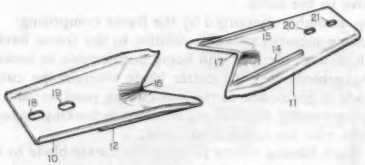
GLASS GOB SHEARING APPARATUS AND METHOD

Edward J. Stengle, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 22, 1975, Ser. No. 579,984

Int. Cl.² B26D *1/06, 7/08*

U.S. Cl. 83—51 14 Claims



1. A pair of cooperating shear blades for severing a gob of molten glass from the end of a stream of glass, each blade comprising a metal plate having a rearward end for mounting said plate on a reciprocable shear arm, and a forward forked cutting edge end, raised rib members protruding from one side of said plates and having coplanar surfaces which define a shear plane, said rib members extending rearwardly from adjacent the tips of said forked cutting edge to beyond the rearmost portion of said cutting edge, and a contoured section sloping from said cutting edge rearwardly to the plate surface opposite from said shear plane side.

11. A method of severing a stream of molten glass comprising the steps of:

providing a downwardly flowing stream of molten glass;

positioning a pair of shearing blades having a cutting edge in a position to periodically interrupt the flowing stream; and

moving the shearing blades in a reciprocating manner so as to interrupt and shear the stream while maintaining the cutting edges in a non-contacting relationship so that the only frictional contact is between the cutting edge of the shearing blades and the molten glass stream.

3,962,940

APPARATUS FOR METERING COPY MATERIAL IN BLUEPRINT MACHINES

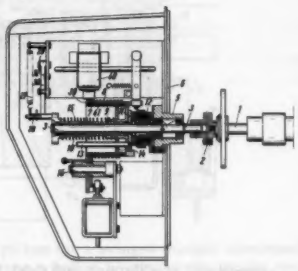
Karl Schleifenbaum, Haiger, and Werner Schweisfurth, Siegen, both of Germany, assignors to Meteor-Siegen Apparatebau Paul Schmeck GmbH, Siegen, Germany

Filed Sept. 10, 1974, Ser. No. 504,834

Claims priority, application Germany, Sept. 10, 1973, 2345538

Int. Cl.² B26D *5/34, 5/00*

U.S. Cl. 83—208 7 Claims



1. In a blueprint machine or the like, apparatus for metering copy material, particularly standard length, from a web of copy material fed through said machine, the original material to be copied in said machine being of variable length, said apparatus having a main shaft driven by a shaft forming a part of the main drive of said machine, a threaded sleeve having a rest position, clutch means inter-connecting said main shaft and said threaded sleeve and driving said sleeve in synchronism with said main shaft when said clutch is engaged, follower means received in the threads of said sleeve and displacing said sleeve axially from said rest positin upon driving of said sleeve by said clutch, and means co-acting with said sleeve for generating a signal upon predetermined displacement of said sleeve for controlling severing of said copy material.

3,962,941

PRESS FOR PERFORATING AND TRIMMING BOARDS OF FILAMENTARY MATERIAL

Harald Kober, Wanne-Eickel, Germany, assignor to G. Siempelkamp & Co., Wanne-Eickel, Germany

Filed Feb. 14, 1975, Ser. No. 550,024

Claims priority, application Germany, Feb. 15, 1974, 2407260

Int. Cl.² B26D *5/20*

U.S. Cl. 83—228 10 Claims

1. A system for punching boards of filamentary material, said system comprising:

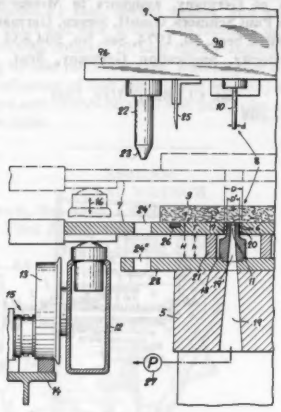
a transport tray carrying a sheet of filamentary material and formed with an array of throughgoing holes of predetermined inside diameter, said tray having an upper and lower surface;

a lower press platen receiving said tray carrying said sheet and formed with an array of upwardly opening apertures each of an inside diameter substantially smaller than said holes and registering with a respective hole of said array of throughgoing holes;

an upper press platen above said lower platen and provided with an array of punch pins each in line with a respective aperture and each of an outside diameter corresponding

substantially to the diameter of said apertures; and

means for relatively displacing said platens together for pressing said pins through said sheet, through said holes, and into said apertures for perforating said sheet.

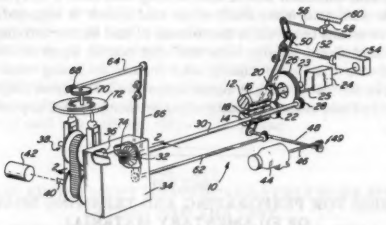


3,962,942

CUTOFF MECHANISM

James T. Ferara, Cherry Hill, N.J., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed Nov. 29, 1974, Ser. No. 528,385
Int. Cl.[2] B26D 1/56; B23D 25/12
U.S. Cl. 83—311 5 Claims



1. Apparatus for cutting a continuously moving web into sheets comprising

at least one continuously driven cutting blade,

a support for said blade,

a selectively adjustable cyclic mechanism connected to said blade support to cyclically drive said blade so that said blade is at web speed at the instant of cutting,

a drive shaft coupled to said cyclic mechanism for driving the same,

a variable speed drive for rotating said drive shaft at a selectively uniform base speed for cutting sheets having a length within a predetermined range,

a cyclic speed transmission for rotating said drive shaft at a cyclic speed for cutting sheets having a length which is a whole number multiple of sheet lengths in said predetermined range,

said cyclic speed transmission including components for generating said cyclic speed while moving at a speed which is a fraction of said uniform base speed of said drive shaft,

said fraction being unity divided by said whole number, and

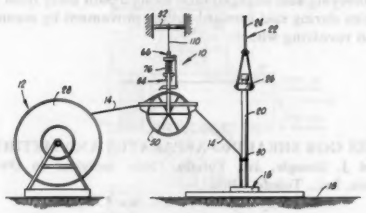
clutch means for selectively connecting the output of said variable speed drive directly to said drive shaft and in the alternative indirectly to said drive shaft by way of said cyclic speed transmission.

3,962,943

SAFETY APPARATUS FOR A CABLE FEED SYSTEM

Burl A. Allen, 419 Garrett, Lindsay, Okla. 73052

Filed Aug. 14, 1974, Ser. No. 497,312
Int. Cl.[2] B26D 5/38
U.S. Cl. 83—370 4 Claims



1. A safety apparatus for a cable feed system, comprising:

a frame;

a pulley rotatably supported at one end of the frame, the cable passable over the pulley;

a cutter blade pivotally supported by the frame and positionable in a cutting position and in a non-cutting position relative to the cable;

a spring assembly supported by the frame comprising:

a locking member movable relative to the frame having a lock end, the lock end being positionable in locking engagement with the cutter blade wherein the cutter blade is positioned in the non-cutting position; and

a spring biasing the locking member in locking engagement with the cutter blade; and,

cutter blade biasing means pivoting the cutter blade to the cutting position when the locking member is in non-locking engagement with the cutter blade.

3,962,944

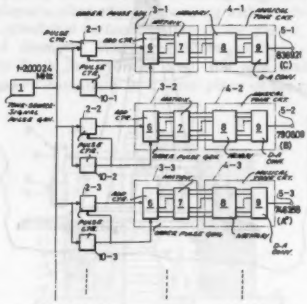
ELECTRONIC MUSICAL INSTRUMENT

Noriji Sakashita, and Seiji Kameyama, both of Hamamatsu, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Feb. 12, 1975, Ser. No. 549,459
Claims priority, application Japan, Feb. 13, 1974, 49-17938
Int. Cl.[2] G10H 5/06
U.S. Cl. 84—1.01 4 Claims

1. An electronic musical instrument comprising a plurality of musical-tone waveform generating means for generating musical tones, a plurality of order pulse generating means for generating order pulses to sample respective of the musical-tone waveform generating means, tone-source-signal generating means for generating a tone-source-signal, and a plurality of counting means coupling said tone-source-signal generating means to respective of said order pulse generating means for dividing the frequency of said tone-source-signal, said counting means including count modifying means to provide for perfecting tone generation, said counting means further including first and second pulse counters each coupled to said tone-source-signal generating means, said first counter being coupled to and supplying count signals to the associated order pulse generating means, said second counter being coupled to

and adapted to reset said first counter, the first and second pulse counters respectively dividing the tone-source-signal by



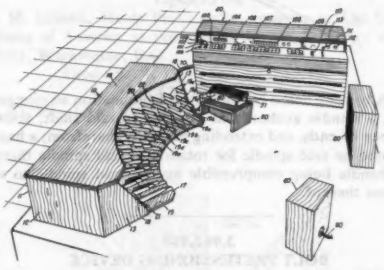
$1/x$ and $1/n$ with the relation of $O<x<n$ with x and n being integral numbers.

3,962,945

FOOT ACTUATED ELECTRONIC ORGAN

Wade E. Creager, and Albert P. Sheppard, both of Atlanta, Ga., assignors to Wade E. Creager, Atlanta, Ga.

Continuation of Ser. No. 372,631, June 22, 1973, abandoned.
This application Dec. 11, 1974, Ser. No. 531,479
Int. Cl.² G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **12 Claims**



1. In an electronic organ of the type having note generating means, and a bass assembly the combination of:

an array of foot pedals adapted for selection by foot depression;

a control pedal adapted for operation by foot depression;

first logic means connected with said note generating means for producing chords corresponding to selected notes;

second logic means connected with said note generating means for producing chords corresponding to other selected notes;

first switch means actuated by said foot pedals for energizing said first logic means, for enabling said second logic means and for energizing said bass assembly; and

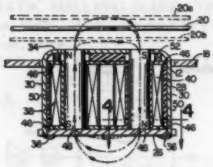
second switch means actuated by said control pedal for energizing said second logic means as enabled by said first switch means, whereby foot operation of said foot pedals and said control pedals provide chord accompaniment so as to free the musician's hands for playing a separate instrument.

3,962,946

MAGNETIC INDUCTION STRINGED INSTRUMENT PICKUP

James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Filed Mar. 10, 1975, Ser. No. 556,896
Int. Cl.² G10H *3/00*
U.S. Cl. 84—1.15 **14 Claims**



1. An electrical pickup for a stringed musical instrument, said pickup comprising a hollow housing of electrically conductive non-magnetic material, first and second coils each having an opening with an axis and each having a front end and a rear end, said two coils being arranged side by side and next to one another within said housing with said axes of their openings parallel to one another, a first permanent magnet element extending axially through the opening of said first coil, a second permanent magnet element extending axially through the opening of said second coil, said first magnet element having a front end with a north magnetic pole adjacent said front end of said first coil and a rear end with a south magnetic pole adjacent said rear end of said first coil, and said second magnet element having a front end with a south magnetic pole adjacent said front end of said second coil and a rear end with a north magnetic pole adjacent said rear end of said second coil, said two coils having substantially equal numbers of turns and each having two end leads, and means electrically connecting one end lead of said first coil solely to one end lead of said second coil so that the electrical circuit between the other two of said end leads consists solely of said two coils connected in series with one another in such a way that an electric current in passing serially through said two coils passes clockwise through one coil and counterclockwise through the other of said coils as viewed looking toward said front ends of said coils, said rear ends of said first and second permanent magnet elements being magnetically separated from one another by material having substantially the permeability of air and said front ends of said first and second permanent magnet elements being magnetically separated from one another by material having substantially the permeability of air, and two bobbins of non-magnetic material on each of which a respective one of said two coils is wound, each of said bobbins having a body portion passing through the opening of its associated coil and said body portion having a hole receiving a respective one of said first and second permanent magnet elements, each of said holes being larger in cross section than its associated permanent magnet element and being defined by a major interior surface and a plurality of projections extending radially inwardly from said major interior surface and engaging the associated one of said permanent magnet elements to hold it in spaced relation to said major interior surface, and a material having the resiliency of silicone rubber filling the spaces between each of said permanent elements and said major interior surface of its associated bobbin hole for dampening vibration of said magnet elements relative to said bobbins.

3,962,947

SOUND PRODUCING APPARATUS

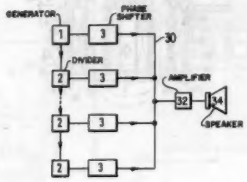
Adolf Michel, Ulrichs-Au 1, D-8124 Seeshaupt, Germany

Continuation of Ser. No. 381,554, July 23, 1973, abandoned, which is a continuation of Ser. No. 191,767, Oct. 22, 1971, abandoned. This application Feb. 21, 1975, Ser. No. 551,829

Claims priority, application Germany, Oct. 26, 1970, 2052463; Feb. 27, 1971, 2109438; Aug. 16, 1971, 2140933

Int. Cl.² G10H *1/04, 5/06*

U.S. Cl. 84—1.24 20 Claims



1. An electronic musical instrument having an increased fullness of tone, said instrument comprising:

a. a signal generator for generating a first audio frequency signal corresponding to a single note of the musical scale, said first signal appearing on a first lead;

b. a plurality of serially connected harmonic generators, the first of which receives said first audio frequency signal from said signal generator and each subsequent harmonic generator receiving a new harmonic of the first audio frequency signal from the preceding harmonic generator, each harmonic generator of the series supplying on a respective tone lead an audio frequency signal constituting a new harmonic of said first audio frequency signal and corresponding to a single note of the musical scale;

c. a phase shifter connected to said first lead and a separate phase shifter connected in each said harmonic generator tone lead for subjecting the signal on the lead in which the phase shifter is connected to a cyclic phase shift which is different than the phase shift to which the other of said signals are subjected;

d. means for controlling the period of cycle of each said cyclic phase shifter so the phase shift is not audibly perceptible in the respective individual note; and

e. output means for electrically interconnecting the phase-shifted signals from said phase shifters and converting said signals into audible sound, whereby to the ear of a listener the sound has the character of notes emanating from a plurality of distinct voices.

3,962,948

ZITHER-CHORD

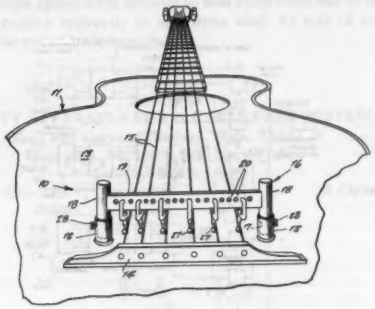
Michael Marletta, 278 E. 203rd St., Bronx, N.Y. 10458

Filed June 9, 1975, Ser. No. 585,071

Int. Cl.² G10D *3/02*

U.S. Cl. 84—294 3 Claims

1. In a zither-chord, the combination of a stringed musical instrument such as a guitar, a pair of socket members affixed upon an upper side of a table of said instrument, each socket member having a socket, and a removable bridge mountable in said sockets said bridge straddling a set of strings of said instrument and means depending from said bridge for being



struck by said strings while vibrating when being plucked during playing.

3,962,949

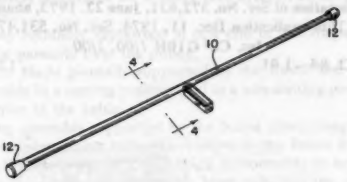
TWIRLING BATON WITH BRAKE

Leonard D. Trowbridge, and Naomi A. Trowbridge, both of 16200 Woodbridge, Harvey, Ill. 60426

Filed Feb. 27, 1975, Ser. No. 553,673

Int. Cl.² G09B *15/02*

U.S. Cl. 84—477 B 4 Claims



1. A twirling baton comprising in combination an elongated shaft, a spindle anchored at one end in said shaft, midway between its ends, and extending normally therefrom, a handle mounted on said spindle for rotation of said spindle therein, said handle being compressible against said spindle to stop rotation thereof.

3,962,950

BOLT PRETENSIONING DEVICE

Jozsef Piroska, Jarfalla, Sweden, assignor to Eric Rummelhoff, Vallingby, Sweden

Filed Jan. 25, 1974, Ser. No. 433,567

Int. Cl.² F16B *37/00*

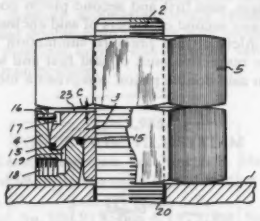
U.S. Cl. 85—32 R 3 Claims

1. A device for tensioning a bolt, having a threaded end projecting from a separate base, during tightening and loosening of a threaded nut carried on the threaded end of the bolt, comprising:

a. an annular piston having a threaded bore for being carried in threaded engagement with said threaded bolt end between said base and said nut in axially spaced relation to said nut, the piston having a stepped external annular surface with a peripheral sealing edge, and the outermost larger diameter piston surface portion converging axially from said step; and

b. an annular cylinder angularly keyed to and slidably receiving and surrounding said piston and defining an annular pressure chamber therewith, said cylinder being adapted to be disposed between and to engage said base and said nut and so sized that the nut can be tightened to

act axially through said cylinder against the base, the cylinder having a stepped annular internal surface comprising a cylindrical larger diameter cylinder surface cooperating with said piston sealing edge and an inner peripheral sealing edge cooperating with a reduced diameter cylindrical surface portion of the piston, and a reduced diameter internal cylinder surface converging axially from the cylinder step, the said sealing edges disposed substantially in a radial plane of the cylinder so



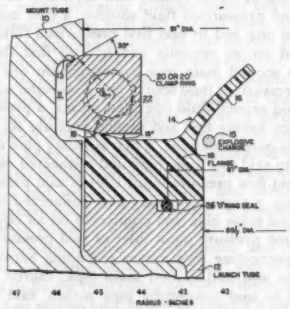
as to enable a slight tilting of the piston in the cylinder, and the said piston-cylinder forming a unit of the same outer configuration as the nut with the ends of the piston spaced axially inwardly of the cylinder end surfaces, said cylinder having fluid inlet means and including a duct extending between said fluid inlet means and said pressure chamber, said piston and said cylinder having sealing means disposed between mating surfaces thereon at the radially innermost and outermost extents of said pressure chamber.

3,962,951

MISSILE LAUNCHING AND HOLD-DOWN DEVICE THEREFOR

Jan M. Schenk, Menlo Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1975, Ser. No. 563,993
Int. Cl.² F41F *3/04*
U.S. Cl. 89—1.81 **7 Claims**



1. A missile launching device comprising:

a mount tube having a circumferential groove near one end of the mount tube, said groove having a tapered surface;

a launch tube within said mount tube below the location of said groove, said launch tube being adapted to contain therein in a lengthwise direction the missile to be launched;

a shatterable end closure for said device having a circumferential flange resting on said launch tube and predominately below said groove;

and a split ring positioned in said groove engaging both said tapered surface of said groove and said flange below said tapered surface; said split ring having a gap;

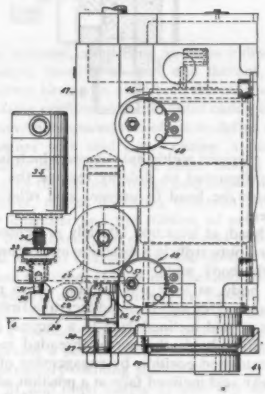
an adjustable spreading element in said gap for engaging both ends of said split ring at said gap, said element being rotatable for exerting expanding circumferential pressure on said ring at the location of said gap to thereby increase the diameter of said ring and increase the pressure on said flange.

3,962,952

AUTOMATIC MILLING SLIDE CONTROL

George Carl Bour, Holly, Mich., assignor to The Valeron Corporation, Detroit, Mich.

Filed May 28, 1974, Ser. No. 473,441
Int. Cl.² B23C *1/027*
U.S. Cl. 90—11 A **7 Claims**



1. A machine spindle position control system for accurately adjusting from work piece to work piece the effective spindle head axial position and face cutting plane of a cutter comprising;

a spindle head assembly mounted on a machine,

bearings in said assembly supporting the said spindle head for axial movement,

adjustable positive stop means coacting with an abutment surface rigidly associated with said axially displaceable spindle, said adjustable positive stop means being actuatable to establish the limit of spindle head advance to an effective fixed operating position preparatory to starting a machining operation on a given work piece,

actuating means for axial advancing and retracting of said spindle head, and maintaining said spindle in advanced position established by said stop means,

and means for adjusting said positive stop position, during retraction of and preparatory to advancing said spindle head axially for successive machining operations on successive work pieces.

3,962,953

ROTARY TOOL HOLDERS

Philip James Brady, Harrow Weald, and Allen John Alford, London, both of England, assignors to Babb Engineering Company Limited, Waltham Cross, England

Filed Dec. 23, 1974, Ser. No. 535,159
Claims priority, application United Kingdom, Dec. 29, 1973, 60139/73
Int. Cl.² B23C *5/28*
U.S. Cl. 90—11 A **8 Claims**

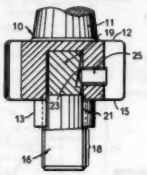
1. In a rotary tool holder of the kind comprising

a rotary body having a forward end which affords an axially extending recess and a radially extending locating face for engagement with a complementary face of a tool to be held, and

a screw threaded member which projects from said recess and is formed with screw thread means for engagement with said tool,

the improvement comprising

a. head means on the screw threaded member, said head means being disposed within said recess for preventing relative rotational movement between the body and the screw thread member, said head means including a transversely extending head to provide a longer transverse head dimension in one direction within a plane than in any other direction within said plane, the head being



slidably received within said recess which is correspondingly configurated to slidably receive the head and to coact with the head to prevent said relative rotational movement,

b. on the head, at least one laterally presented face which is inclined outwardly in a direction away from the forward end of the body, and

c. on the body, at least one locking screw movable in a direction towards said inclined face to a first position and away from said inclined face to a second position, said first position holds the screw threaded member in an axially retracted position by engagement of said locking screw with said inclined face at a position adjacent to the end thereof nearer the forward end of the body, said second position allows the screw threaded member to move axially outwardly relative to the body.

3,962,954

SUPPLY APPARATUS FOR TWO RECEIVING MEANS HAVING A PRESSURE SUMMATION DEVICE

René F. Jacob, Le-Plessis-Belleville, and Pierre C. Fillion, Nanteuil-le-Haudouin, both of France, assignors to Poclain, Le-Plessis-Belleville, France

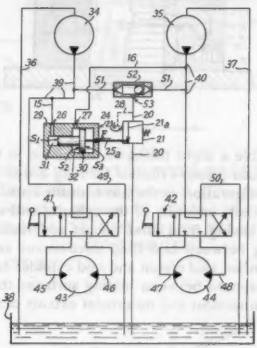
Filed Feb. 3, 1975, Ser. No. 546,830

Claims priority, application France, Feb. 4, 1974, 74.03659

Int. Cl.[2] F15B 11/16

U.S. Cl. 91—412 **4 Claims**

1. A hydraulic power supply system for supplying pressurized fluid to first and second fluid operated means such as hydraulic motors, said system comprising pressurized fluid source means, a flow divider having an inlet and first and second outlets, a delivery pipe connecting said pressurized fluid source means to said inlet of said flow divider, first and second main pipes each of which is connected on one end to one of the fluid operated means and on an opposite end to one of the outlets of said flow divider, a pressure summation device having first and second inlets, a first auxiliary pipe connecting one of said main pipes to said first inlet of said pressure summation device, a second auxiliary pipe connecting the other one of said main pipes to said second inlet of said pressure summation device, a shunt discharge pipe connected on one end to said delivery pipe, a calibrated relief valve positioned in said shunt discharge pipe and including a movable valving member mounted for movement between an open position in which flow through said shunt discharge pipe is permitted and a closed position in which flow through said shunt discharge pipe is prevented, said valving member being urged toward said open position by the pressure of fluid in the portion of said discharge pipe located between the connection of the discharge pipe to the delivery pipe and the calibrated relief valve, said pressure summation device including an enclosure defining first and second cylinder sections, a double piston having first and second piston portions of different cross-sectional area, said first piston portion being mounted for reciprocation in said first cylinder section and said second piston portion being mounted for reciprocation in said second cylinder section, said first and second piston portions having faces in first and second chambers of said enclosure, said first and second inlets of said pressure summation device being connected to respective ones of said first and second chambers, wherein said double piston comprises a movable output



member which exerts a force which is indicative of the sum of the pressures supplied to said first and second inlets of the pressure summation device and means mechanically connecting said double piston to said movable valving member of said relief valve for urging said movable member with progressively increasing force toward its open position as the sum of the pressures in the inlets of said pressure summation device increases.

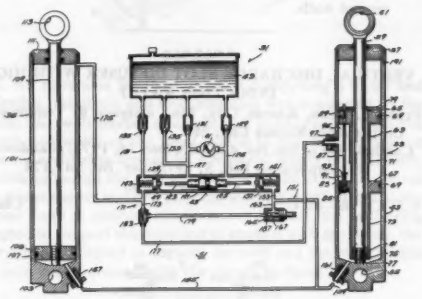
3. An apparatus for supplying pressurized fluid to first and second fluid operated means, said apparatus comprising first and second pressurized fluid sources, a first main pipe connected on one end to said first pressurized fluid source and connected on an opposite end to said first fluid operated means, a second main pipe connected on one end to said second pressurized fluid source and connected on an opposite end to said second fluid operated means, a pressure summation device having first and second pressure input inlets and a movable output member, a first auxiliary pipe connected on one end to said first main pipe and connected on an opposite end to said first pressure input inlet of said pressure summation device, a second auxiliary pipe connected on one end to said second main pipe and connected on an opposite end to said second pressure input inlet of said pressure summation device, connecting pipe means extending between said first main pipe and said second main pipe, shuttle valve means mounted in said connecting pipe means, said shuttle valve means having a discharge outlet, a discharge pipe connected to said discharge outlet of said shuttle valve means, a calibrated relief valve mounted in said discharge pipe, said calibrated relief valve having a movable valving member movable between an open position and in which flow through said discharge pipe is freely permitted and a closed position blocking flow through said open position by the pressure of fluid in the portion of said discharge pipe located between the outlet of said shuttle valve and said calibrated relief valve, said fluid pressure in said portion of said discharge pipe being applied to said movable valving member by a control pipe connected to said portion of said discharge pipe on one end and on an

opposite end to the body of said relief valve, said pressure summation device comprising an enclosure providing first and second cylinder sections, a double piston having first and second piston portions respectively mounted in said first and second cylinder sections, said first and second piston portions having faces in first and second chambers in said enclosure, said first and second inlets of said pressure summation device being connected to respective ones of said first and second chambers and means mechanically connecting said double piston to said movable valving member of said calibrated relief valve so that the sum of the pressures in said first and second inlets of the pressure summation device results in a force exerted by said double piston which is in proportion to the sum of said pressures urging said movable valving member toward said open position.

3,962,955
POWER TRIM-TILT SYSTEM

Gaylord M. Borst, Waukegan, and Martin H. Meyer, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 320,913, Jan. 4, 1973, Pat. No. 3,885,517. This application Mar. 12, 1974, Ser. No. 450,465
Int. Cl.² F15B *15/22*
U.S. Cl. 91—401 **2 Claims**

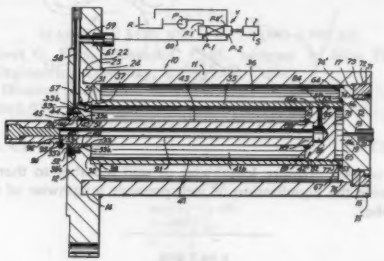


1. A single acting hydraulic cylinder-piston assembly comprising a cylinder having first and second ends, and a constantly open vent opening adjacent to said second end of said cylinder, a piston assembly located in said cylinder for movement axially thereof and including a first piston sealingly engaged with said cylinder, located adjacent to said first end of said cylinder, and having therein a port, a second piston sealingly engaged with said cylinder and spaced axially from said first piston and located adjacent to said second end of said cylinder, tubular means connecting said first and second pistons said first and second pistons and said tubular means defining therebetween an annular space, a piston rod, said piston rod being mounted within said tubular means for limited axial movement relative to said pistons and cylinder, a first hydraulic fluid fitting adjacent said first end of said cylinder, a second hydraulic fluid fitting on said cylinder intermediate said first and second pistons and communicating with said annular space at all positions of said piston assembly in said cylinder, valve means normally closing said port, and position responsive means for operating said valve means to open said port upon movement of said piston assembly to adjacent said second end of said cylinder, said valve means includes a valve member, and said operating means comprises an axially extending bore in said second piston and a valve stem on said valve member and extending through said bore in said second piston for engagement with said second end of said cylinder upon movement of said piston assembly to adjacent said second end of said cylinder.

3,962,956
HYDROPNEUMATIC VALVE ACTUATOR

Alphonse A. Jacobellis, Woodland Hills, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed Nov. 19, 1974, Ser. No. 525,203
Int. Cl.² F15B *11/08, 13/04, 21/04*
U.S. Cl. 91—418 **9 Claims**



1. A valve actuator comprising an outer cylindrical casing having a closure member at each end thereof, one of said closure members having an axial bore therethrough, an inner cylindrical casing positioned in said outer casing coaxial therewith and transversely spaced therefrom to define an elongated annular chamber with said outer casing, a piston slidably mounted in said inner casing, said piston having a piston rod extending axially therefrom through said axial bore in said one closure member, means providing communication between said annular chamber and the portion of said inner casing between the other closure member and said piston means for charging said annular chamber and the portion of said inner casing between the other closure member and said piston with gas under pressure, means to supply the portion of said inner casing between said one closure member and the piston with liquid under a pressure higher than said gas under pressure, said piston having a pair of spaced annular sealing members in its outer periphery defining seals with respect to the inner wall surface of said inner casing at least one of said pair of sealing members preventing gas leakage into the portion to be charged with liquid and means to detect liquid leakage past at least one of said pair of said sealing members, said leakage detecting means including passageway means for communicating the outer periphery of the piston between said pair of sealing members with the ambient, said passageway means including normally closed relief valve means for venting liquid in said passageway means by opening at a pressure lower than liquid pressure in said inner casing between said one closure member and the piston, said relief valve remaining closed at pressures between said gas pressure and said liquid pressure such as to prevent venting to ambient of gas leakage past another of said sealing members into said passageway means.

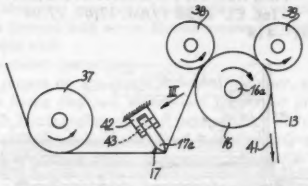
3,962,957
CURLING DEVICE FOR WEBS OF PAPER OR THE LIKE

Alfred Hinzmann, Richmond, Va., assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Sept. 10, 1974, Ser. No. 504,757
Int. Cl.² B31F *7/00*
U.S. Cl. 93—1 R **10 Claims**

1. Apparatus for reducing localized stresses in and/or for equalizing the length of lengthwise extending portions of a web consisting of paper of other flexible material, particularly of a web which is stored in the form of a bobbin and is used in the manufacture of smokers' products, comprising means for moving a web lengthwise along a predetermined path; a supporting device adjacent to said path; and a curling device mounted in said supporting device and having an elongated web contacting member extending substantially transversely of and into said path so that one side of the web in said path exerts pressure against and the web is flexed by said member,

at least said member of said curling device being tiltable (movable) with respect to said supporting device in a plane extending transversely of said path in response to unequal distribu-



tion of web pressure lengthwise of said member to thereby promote the equalization of web pressure lengthwise of said member.

3,962,958

TUBE FORMER WITH WEAR INSERT

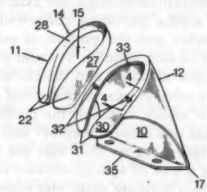
Jack Hobart, 24, Riversleigh Road, Leamington Spa, England

Filed Jan. 21, 1975, Ser. No. 542,815

Claims priority, application United Kingdom, Jan. 24, 1974, 3304/74

Int. Cl.² B31B *1/36, 23/26;* **B65B** *9/06*

U.S. Cl. 93—20 **3 Claims**



1. A former, for manipulating an elongate sheet of packaging material into a tube, comprising the combination of a body and a wear insert, a preformer surface jointly defined by said body and said wear insert over which the sheet is to be pulled, the preformer surface terminating in an edge, said edge defining an aperture through which the sheet is to be drawn in a predetermined direction that is at an acute angle to the preformer surface, the aperture and the preformer surface being so shaped and positioned relative to each other that the portion of the sheet passing through the aperture will be manipulated into a tube having its longitudinal edges slightly overlapped, the wear insert being detachably supported by the body and defining both the aforesaid edge of the preformer surface and a continuous portion of the preformer surface lying immediately adjacent the edge, the wear insert also defining a continuous portion of a surface within the aperture, and the body and the wear insert abutting on a generally flat surface which does not intersect the edge defining the aperture and is positioned so that the wear insert will be substantially symmetrical.

3,962,959

METHOD OF MAKING DISPOSABLE CONTAINER FOR BULK MATERIALS

Robert R. Williamson, Dallas, Tex., assignor to Better Agricultural Goals Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 460,053, April 11, 1974. This application Dec. 16, 1974, Ser. No. 533,461

Int. Cl.² B31B *39/00*

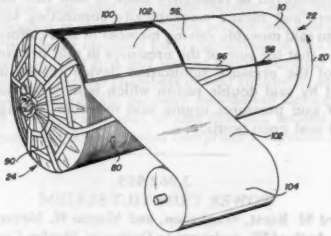
U.S. Cl. 93—35 R **30 Claims**

4. A method of forming a receptacle comprising the steps of:

a. locating a first cylindrical wall of sheet material in a work area;

b. positioning a second cylindrical wall of sheet material concentrically around said first wall;

c. attaching a filament material to the exterior of said second wall to define the body of the receptacle;



d. positioning a sling around the exterior of said second wall with the sling extending longitudinally along the body of the receptacle from one end thereof to the other;

e. positioning a third cylindrical wall of sheet material concentric with said second wall and around the exterior of said sling; and

f. releasably closing the ends of one end of said first and second walls.

3,962,960

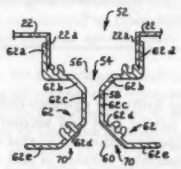
VERTICAL DISCHARGE SLOT DIFFUSER WITH HIGH INDUCTION RATIO

Frank J. Dean, Kansas City, Mo., assignor to Tempmaster Corporation, Kansas City, Mo.

Continuation of Ser. No. 428,333, Dec. 26, 1973, abandoned. This application Feb. 5, 1975, Ser. No. 547,174

Int. Cl.² F24F *13/06*

U.S. Cl. 98—40 C **2 Claims**



1. In an air diffuser device positionable near a wall or window to reduce the effect of thermal leakage through same, the improvement comprising:

a housing having an inlet suitable for connection with a source of conditioned air;

an elongate outlet slot extending substantially the length of said housing to direct air generally vertically therefrom, said outlet slot being of substantially uniform width;

a pair of substantially parallel flanges extending from said housing on opposite sides of said outlet slot to define the width thereof; and diffuser structure including:

a pair of substantially parallel flange sections secured to the respective flanges of said housing in overlapping relation therewith;

first wall portions coupled with said flange sections and spaced apart from one another, said first wall portions being angled to define a converging section for receiving air from said outlet slot;

second wall portions extending in spaced apart relation from said first wall portions, said second wall portions being substantially parallel to define a restricted throat section adjacent said conveying section; and

third wall portions extending in spaced apart relation from said second wall portions, said third wall portions being angled to define a diverging discharge section adjacent said throat section,

said wall portions each forming a substantial part of said diffuser structure and said diverging, throat and converging sections each being symmetrical with respect to a vertical plane passing therethrough.

3,962,961

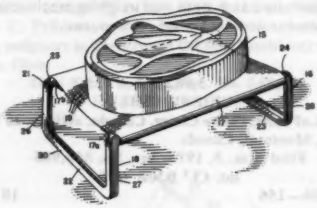
APPARATUS FOR ROASTING MEAT

Leo Peters, 750 Plymouth Road, SE., Grand Rapids, Mich. 49506

Division of Ser. No. 50,374, June 29, 1970. This application Jan. 2, 1975, Ser. No. 537,892

Int. Cl.[2] A47J *43/18*

U.S. Cl. 99—426 4 Claims



1. An apparatus for roasting meat comprising a frame and a flexible, relatively non-heat-retaining web supported by the frame, the web having a length and width greater than the length and width of the meat that is to rest and be roasted thereon and being formed of a material which is sufficiently flexible to permit the web to conform to the contour of meat of various shapes and of a material which is comfortable to the human hand at roasting temperatures of meat, the web being adapted to support the meat out of contact with the frame, the frame being adapted to support the web and the meat within an oven out of contact with the oven's surfaces.

3,962,962

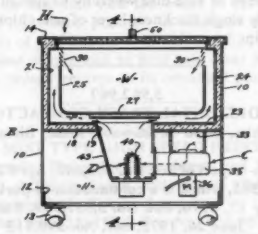
SYSTEM AND HOT CABINET SERVER

William G. Anderson, 5942 Gildred Circle, Huntington Beach, Calif. 92647

Filed Oct. 3, 1974, Ser. No. 511,625

Int. Cl.[2] A47F *3/04*

U.S. Cl. 99—474 12 Claims



4. A Hot Cabinet for conditioning pre-packaged foods and the like and to maintain the same at a predetermined temperature and including; a bin type cabinet body of three dimensional rectangular configuration with corner related side and end and bottom panels, an upwardly open well complementary to and depending into the body in spaced relation to the side and end and bottom panels thereof and forming a plenum therebetween, there being a central opening through the said bottom panel, a temperature responsive heating means in open communication with the plenum through said central opening, and means inducing air from the corners of the well and discharging the same from the sides of the well and thereinto for recirculation.

3,962,963

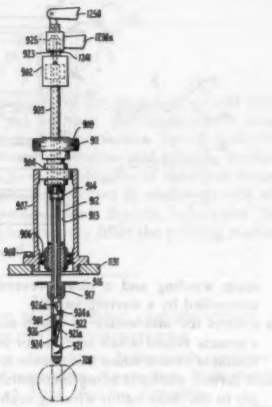
MACHINE FOR SEED CELLING APPLES

Robert G. Ellis, Richmond, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Division of Ser. No. 247,838, April 26, 1972, Pat. No. 3,869,974. This application Jan. 9, 1974, Ser. No. 431,691

Int. Cl.[2] A23N *4/14*, *7/08*; A47J *25/00*

U.S. Cl. 99—544 5 Claims



1. A seed celling knife comprising a tubular member adapted to be moved axially into and out of a cylindrical core hole cut in a piece of fruit, said tubular member having a slot in one side thereof, means for moving the member into and out of the core hole in the fruit, a seed celling knife means having a cutting edge and mounted pivotally in the tubular member and pivotally movable between a first position wherein the knife cutting edge is confined within the tubular member and a second position wherein the knife cutting edge projects radially outwardly through the slot and beyond the tubular member, and means for moving the knife cutting edge from the first position to the second position as the tubular member is moved into and out of the core hole, said means comprising a reciprocating rod axially reciprocable in the tubular member and having a camming surface thereon engageable with the knife means to effect progressive extension and retraction of the knife cutting edge as the rod is reciprocated.

3,962,964

COMPACTOR CYCLE CONTROL

Elnar O. Engebretsen, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Sept. 17, 1974, Ser. No. 506,695

Int. Cl.[2] B30B *15/14*

U.S. Cl. 100—51 4 Claims

1. In a trash compacting machine having a receptacle for material to be compacted within a compacting compartment,

a door enabling placement of the receptacle within and withdrawal of the receptacle from said compacting compartment,

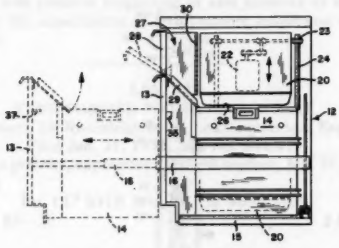
a ram mounted for cyclical movement in a compacting stroke from a starting position outside said receptacle to a compacting position within said receptacle and thereaf-

ter in a retracting stroke to its starting position, said ram in its compacting position preventing deposit of trash in said receptacle,

a storage compartment associated with said machine adjacent said compacting compartment,

an access door for said storage compartment for placement of trash therein, said storage compartment being accessible through said access door to receive and hold trash while said receptacle is within said compacting compartment and said ram is in compacting position within said receptacle and being operable to transfer the held trash into said receptacle when said ram is later moved to said starting position,

means for driving said ram through the compacting and retracting strokes including an induction motor having a



main winding and a phase reversible starting winding controlled by a starting switch,

a control for said motor in which said starting switch has contacts closed when said motor is stopped and further contacts closed when said motor is running,

said further contacts being incorporated in the power supply to the mian motor winding such that said motor stops when stalled at the end of a compacting stroke,

and a cycle selector switch connected when closed to bypass said further contacts to complete a starting circuit causing a retracting stroke of the ram,

said cycle selector switch providing a selection between complete cycle operation and an interrupted cycle in which said ram is stopped at the end of its compacting stroke.

3,962,965

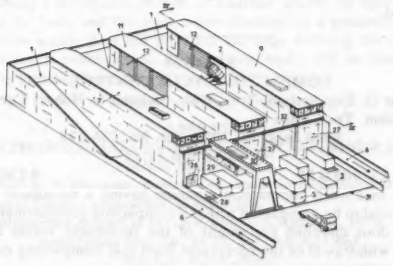
PLANT FOR THE COMPRESSION OF GARBAGE

Antoine Corompt, Saint-Etienne, France, assignor to Bennes Marrel, Saint-Etienne, France

Filed July 18, 1972, Ser. No. 272,839

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—99 **14 Claims**



1. A non-transportable plant for the compaction of garbage or refuse and its removal in containers, comprising:

a large capacity storage pit for the unloading of refuse;

compactor means placed at the end of said storage pit for the compaction of garbage or refuse into the container;

a hopper disposed above said compactor means;

transferring means in said storage pit for transferring the garbage from said storage pit to said hopper;

a weighing machine having a scale plate, said scale plate being disposed in front of the outlet of said compactor means so as to align any container employed thereon with said compactor means;

first and second carriers, said first carrier flexibly connected to said second carrier;

longitudinal tracks on each of said carriers for carrying a container thereon;

a transverse track on which said first and second carriers are moveable in a transverse direction, a portion of said transverse track being located upon said scale plate;

alternating translation means for causing said carriers to travel on said transverse track in order to bring each carrier alternately onto said weighing machine and into alignment with said compactor means.

3,962,966

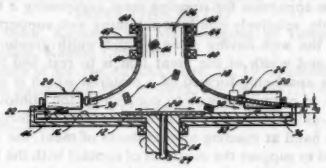
CHIP CRUSHER

Joseph A. LaPointe, Pointe Claire, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Mar. 3, 1975, Ser. No. 554,985

Int. Cl.[2] B30B *3/02*

U.S. Cl. 100—156 **18 Claims**



1. A crusher comprising a disc, means to rotate said disc on an axis, said disc having a working surface, a housing enclosing said disc, an inlet in said housing for feeding chips to said disc adjacent said axis, an outlet from said housing, at least one roll mounted for rotation on its longitudinal axis, said roll cooperating with an annular area of said working surface to form a nip, the surface of said roll and said annular area being substantially parallel in said nip, means to fling said chips radially outward of said disc whereby to spread said chips in a substantially single thickness layer of said chips and to introduce said chips into said nip.

3,962,967

HORIZONTAL TRASH COMPACTOR

Lewis P. White, 3436 Brookwood Road, Birmingham, Ala. 35223

Continuation-in-part of Ser. No. 246,640, April 24, 1972, Pat. No. 3,893,385, which is a continuation-in-part of Ser. No. 55,706, July 17, 1970, Pat. No. 3,657,999. This application June 26, 1975, Ser. No. 590,513

Int. Cl.[2] B30B *1/08*, *15/32*

U.S. Cl. 100—191 **14 Claims**

1. A trash compactor comprising:

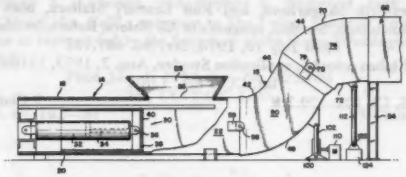
a. an elongated chamber, said elongated chamber including a rectilinear section and a curvilinear section,

b. means for admitting trash to said rectilinear section,

c. power means for moving trash longitudinally through said rectilinear section into said curvilinear section,

d. the trash frictionally engaging the walls of the curvilinear

portion to compress the same, and



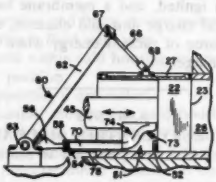
e. means for selectively changing the angularity of the curvilinear section to vary the friction between the trash and walls, for controlling the compression of the trash.

3,962,968

SELF CLOSING DOOR FOR BALING PRESS

Murray C. Tribbett, and Nicholas L. Manko, both of Piqua, Ohio, assignors to The French Oil Mill Machinery Company, Piqua, Ohio

Filed Feb. 10, 1975, Ser. No. 548,393
Int. Cl.² B30B *15/30*
U.S. Cl. 100—215 **5 Claims**



1. In a baling press having means defining a cavity with loading and unloading openings, door means controlling said loading opening, a bolster movably supported in said cavity and arranged to move past said loading opening to reduce the volume of said cavity and compress material loaded therein, a ram connected to reciprocate said bolster within said cavity between a retracted position clear of said loading opening and an advanced position beyond said loading opening,

the improvement comprising means pivotally mounting said door means for movement between an open position extending above said cavity and in a plane transversely of the path of movement of said ram and a closed position extending across said loading opening,

cooperating cam and follower means mounted one to reciprocate with said ram and the other to move said door means to its closed position in response to advancing movement of said bolster from its retracted position in a compression stroke and to hold said door means closed until said bolster returns to its retracted position.

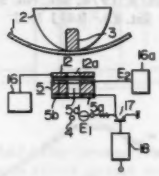
3,962,969

INK MIST TYPE HIGH SPEED PRINTER

Akinori Watanabe; Katsuhide Tanoshima, and Matsusaburo Noguchi, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Nov. 22, 1974, Ser. No. 526,387
Claims priority, application Japan, Dec. 3, 1973, 48-134408
Int. Cl.² G01D *15/16*
U.S. Cl. 101—1 **3 Claims**

1. In an ink mist type printer for use in printing information on a printing medium, which printer includes means for generating an ion stream comprising a pair of spaced upper and lower electrodes to which a high voltage is applied, means positioned between said electrodes for modulating said ion stream including an electrically controlled aperture board having a plurality of apertures therein, said apertures being positioned in at least one aligned row through which the ion stream passes and is modulated, means for supplying an ink mist between the aperture board and the upper of said electrodes whereby the modulated ion stream charges the mist according to the pattern to be printed on a printing medium arranged parallel to the flow of said ink mist and between said upper electrode and the aperture board whereby characters



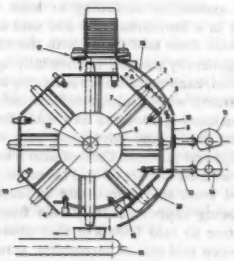
are printed on said medium by the attraction to said upper electrode of the charged ink mist; the improvement which comprises a conductive dust protection board positioned above said aperture board and below said printing medium, said protection board having a plurality of apertures formed therein corresponding to and located in alignment with said apertures of said aperture board, thereby to prevent dust particles from falling downwardly from the printing medium onto said aperture board.

3,962,970

APPARATUS FOR SUPPORTING AND PRINTING NON-CIRCULAR CONTAINERS

Robert Willem Tielrooy, Amstelveen, Netherlands, assignor to Van Dam Machine Corporation, Amsterdam, Netherlands

Filed Dec. 2, 1974, Ser. No. 528,909
Claims priority, application Netherlands, Dec. 6, 1973, 7316702
Int. Cl.² B41F *17/26*
U.S. Cl. 101—38 A **4 Claims**



1. In an apparatus for printing on the outer surface of a container having a given cross sectional area by rotating or moving the container surface around rotatable mandrel means which reach into the container for pressing the container surface against a rotating printing surface, the improvement wherein said mandrel means comprise a first mandrel, means rotatably supporting said first mandrel, said first mandrel having a circular cross section smaller in area than said given cross sectional area of said container, said first mandrel being positioned relative to said rotating printing surface to perform said pressing of the outer container wall against the printing surface, a second mandrel located in parallel to and spaced from said first mandrel for cooperation with said first mandrel inside a container to position said container prior to printing, and actuating means operatively connected to said second

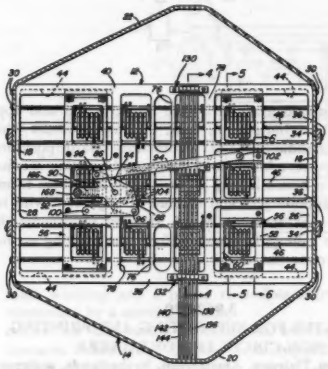
mandrel for withdrawing said second mandrel from said container prior and during printing.

3,962,971

GANG-TYPE PRICE MARKER

Ralph L. J. Armstrong, 2202 Monticello Place, Springdale, Ark. 72764, and Jeffrey M. Stockton, 41 Eastwood Drive, Hutchinson, Kans. 67501

Filed Oct. 3, 1974, Ser. No. 511,701
Int. Cl.² B41J 1/32
U.S. Cl. 101—42 5 Claims



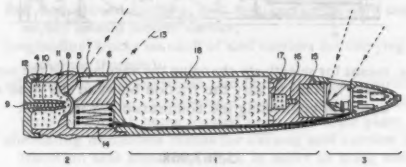
1. A price marker for price stamping all containers in a case or carton at one time, said marker including a frame, at least two sets of price stamp assemblies supported from said frame, each set of assemblies including at least three assemblies spaced apart in a horizontal row and said sets of assemblies being supported from said frame with the rows of assemblies disposed in generally parallel horizontally spaced apart side-by-side relation, each price stamp assembly including a plurality of price stamp wheels supported for independent angular adjustable positioning about an axis extending transversely of said rows and in a plane containing said rows for bringing selected peripheral portions thereof into a lower price stamping position, at least one set of said assemblies being stationarily supported from said frame and at least one set of said assemblies being supported from said frame for adjustable shifting relative to said frame in said plane for varying the spacing between said sets of assemblies, actuator means shiftably supported from said frame and operatively connected to said adjustably shiftable set of assemblies for simultaneously shifting all of the assemblies of said shiftable set relative to said frame, each wheel of each assembly corresponding to a predetermined wheel of each other assembly, and price change adjustment means shiftably supported from said frame and including a shiftable operator associated with each group of corresponding stamp wheels of said sets of assemblies, and connecting drive means operatively connected between each operator and the associated group of stamp wheels of said assemblies, whereby adjustment of each operator will simultaneously adjustably shift the associated stamp wheels of all stamp assemblies, said connecting drive means including means operative to adjust the associated stamp wheels of the stationary assemblies as well as the adjustable sets of assemblies throughout the range of adjustment of said adjustable sets of assemblies relative to said frame

3,962,972

DEVICE FOR EMITTING RADIATION, FOR A PROJECTILE, SHELL ETC.

Lars-Erik Skagerlund, and Rolf Lennart Stalfors, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed July 10, 1974, Ser. No. 487,102
Claims priority, application Sweden, Aug. 3, 1973, 7310678
Int. Cl.² F42C 13/02
U.S. Cl. 102—70.2 R 9 Claims



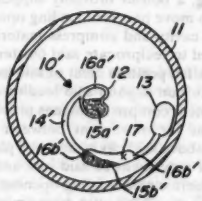
1. A device for emitting radiation from a projectile comprising a pyrotechnical charge located within the body of said projectile, an opening in the body of said projectile, means defining a channel extending between said opening and the space within said body containing said pyrotechnical charge for emitting radiation via said channel and opening when said charge has been ignited, and a membrane located between said pyrotechnical charge and said channel, said membrane comprising a source of radiant energy when heated by said pyrotechnicaL charge.

3,962,973

TIME DELAY CONTROL MECHANISM

Don M. Duel, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 29, 1974, Ser. No. 518,325
Int. Cl.² F42C 15/26
U.S. Cl. 102—80 7 Claims



1. A time delay mechanism in a safing and arming device of a spin-projectile, comprising:

first chamber disposed substantially at the center axis of said projectile,

second chamber disposed at a greater radius than said first chamber,

fluent material contained in said first chamber for rendering said spin-projectile safe,

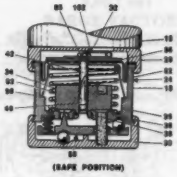
means for retaining said fluent material in said first chamber, said retaining means removable upon application of a set back force applied to the projectile, and

a channel connecting said first chamber to said second chamber, said channel is so formed as to retain said fluent material when acted upon by both the centrifugal force and the force of angular acceleration of said spin-projectile in motion and to allow said fluent material to move to said second chamber when the force of said angular acceleration is removed from said fluent material for arming said spin-projectile.

3,962,974
PRESSURE-ARMED ORDNANCE FUZE

Matthew E. Anderson, and Stephen L. Redmond, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 4, 1973, Ser. No. 322,804
Int. Cl.² F42C 5/00
U.S. Cl. 102—81 5 Claims



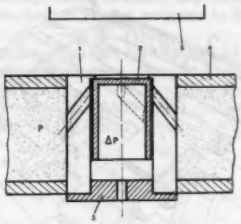
1. A safety, arming and firing device comprising:
a housing having a fluid inlet port;
a rotor mounted within said housing and normally oriented to a "safe" position;
said rotor supporting a detonator;
a firing mechanism mounted in said housing for initiating said detonator when aligned therewith;
rectilinear driving means positioned within the housing and movable a predetermined distance in one direction with respect to the rotor in response to a predetermined external source of fluid pressure admitted through said inlet port to orient the rotor in a "commit-to-arm" position;
said driving means having means for rotating the rotor from the "commit-to-arm" position to an "armed" position where said detonator is aligned with the firing mechanism;
an arming spring energized by said fluid pressure for returning said driving means toward the original position in the absence of said fluid pressure to effect said rotor rotation;
means for locking said driving means in said "safe" position;
said locking means comprising a shoulder on the internal wall of the housing and a crown spring having laterally compressible fingers normally engaging said shoulder;
means responsive to the fluid pressure for releasing said locking means;
said releasing means being a flexible cup-shaped diaphragm extending across said housing to seal the rotor from the inlet port, said diaphragm having a portion extending laterally adjacent said fingers for disengaging the latter under fluid pressure.

3,962,975
FLUIDIC VALVE

Philippe Jean Monserie, Le Monceau, Estouy-par-Pithiviers (Loiret), France

Filed Dec. 23, 1974, Ser. No. 535,210
Claims priority, application France, Dec. 26, 1973, 73.46691
Int. Cl.² B61B 13/08
U.S. Cl. 104—23 FS 10 Claims

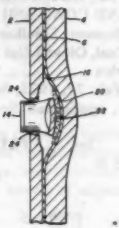
1. A fluidic valve for permitting the propelling and sustaining of a moving body on an air cushion by means of a fluid under pressure, said valve having orifices receiving fluid under pressure, said valve including a hollow piston, a jacket having said piston movable therein, and said jacket including a base, a stopper closing the base of said jacket, there being a vent in said stopper, said jacket including lateral openings that communicate with the fluid under pressure, and wherein said last named openings can be closed by said movable piston.



3,962,976
COMPOSITE ARMOR STRUCTURE

Ronald A. Kelsey, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 16, 1971, Ser. No. 172,132
Int. Cl.² F41H 5/04
U.S. Cl. 109—82 6 Claims



1. A composite armor structure comprising
a frontal plate composed of an aluminum-zinc alloy having an ultimate tensile strength greater than 70 ksi,
a backup plate composed of an aluminum-magnesium alloy having an ultimate tensile strength of about 30 to 70 ksi,
a non-metallic filler material interposed between said frontal plate and said backup plate, and
said filler material being selected from the group consisting of epoxies, phenolics, polyesters, polycarbonates and high density polyvinyls, whereby said composite armor structure resists passage of shell fragments therethrough and resists rearward discharge of spalled material upon frontal plate impact by a projectile.

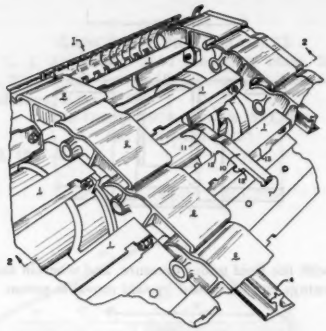
3,962,977
GRATE BAR CASTING FOR INCINERATOR OR OTHER CONVEYOR

Tracy C. Calame, Godfrey, and William A. Cannon, Alton, both of Ill., assignors to Illinois Stoker Company, Alton, Ill.

Filed Dec. 23, 1974, Ser. No. 535,961
Int. Cl.² F23B 1/22
U.S. Cl. 110—38 9 Claims

1. An improvement in a grate bar casting for use as a component in a conveyor and of the type for supporting the links forming the conveyor surface and incorporating a length of web having integral upper and lower flanges to support the weight of said conveyor links and any materials deposited thereon, the improvement which comprises at least one gusset connecting integrally with the web and extending the spacing between and connecting to the upper and lower integral flanges to enhance the load bearing attributes of the grate bar,

said gussets being disposed inwardly from the ends of said grate bar, with one of said gussets being disposed centrally to



one side of the bar web, and a pair of said gussets being arranged off-center to the other side of said bar web.

3,962,978

HANDLING OF HOT PARTICULATE MATERIALS, SUCH AS FOR EXAMPLE, HOT AGGLOMERATED COAL ASH AND COAL ASH CLINKER

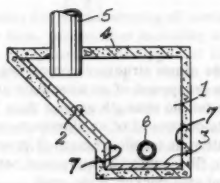
Abraham Daniel Bosman, Sasolburg, South Africa, assignor to South African Coal, Oil and Gas Corporation Limited, Sasolburg, South Africa

Filed Feb. 27, 1975, Ser. No. 553,787

Claims priority, application South Africa, Feb. 27, 1974, 74/1296

Int. Cl.² F23J *1/00*

U.S. Cl. 110—165 R **21 Claims**



1. A method of handling hot particulate material including the steps of producing a flow of liquid coolant of increasing depth over a solid surface, in which there is substantially no increase in the width of flow with increasing depth; introducing hot particulate material into the path of flow of coolant to create a temporary barrier arresting the flow of coolant; and allowing accumulated coolant to breach the barrier and carry away with it particulate material of the temporary barrier, the rate of flow of liquid coolant being sufficiently low that a protective layer of particulate material is formed on said surface to minimize wear of said surface.

4. Means for handling hot particulate material including a longitudinally inclined sluiceway with a cross-sectional configuration such that there is substantially no increase in the width of a flow of liquid therealong with increasing depth; means defining a receiving zone transversely offset from the longitudinal centre line of the sluiceway to receive hot particulate material and to allow such material to enter the sluiceway; and means to introduce liquid coolant into the sluiceway to produce a flow of coolant at a low rate over substantially the entire width of the sluiceway past the region in which particulate material enters the sluiceway from the receiving zone, the sluiceway having a substantially plane bottom and sides, the sides being substantially vertical or inclined to converge upwardly.

3,962,979

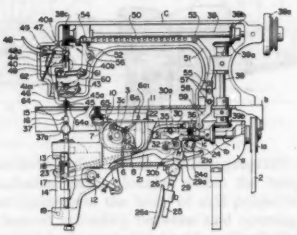
SEWING MACHINE

Yazaki Yoshiharu, 4-11, Shinjuku 1-chome, Shinjuku, Tokyo, Japan

Filed Jan. 14, 1975, Ser. No. 541,063

Int. Cl.² D05C *3/02*

U.S. Cl. 112—98 **3 Claims**



1. A sewing machine comprising an upper main shaft, a lower main shaft, means for rotatably driving said upper and lower main shafts, a bed, a needle bar provided below said bed, means connecting said needle bar to be driven by said lower main shaft to effect vertical and lateral reciprocal movement thereof, a needle affixed to said needle bar for vertical and lateral movement therewith, means for feeding an underthread to said needle, shuttle means provided above said bed for supplying therefrom an embroidery thread to said needle, said shuttle means being driven by said upper main shaft, and means pivotally connected with said needle bar and extending therefrom to above said bed for effecting lateral movement of said shuttle means in synchronism with movement of said needle, said embroidery thread being affixed with said underthread to cloth passed through said sewing maching by operation of said needle.

3,962,980

THREAD CUTTER FOR SEWING MACHINES

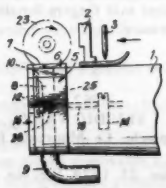
Arne Marius Hedegaard, Hvidovre, and Hugo Sand Jensen, Copenhagen, both of Denmark, assignors to Rothenborg Patent & Licens K/S, Copenhagen, Denmark

Filed Feb. 18, 1975, Ser. No. 550,225

Claims priority, application Germany, Mar. 18, 1974, 2412989

Int. Cl.² D05B *65/02*, *65/06*

U.S. Cl. 112—252 **5 Claims**



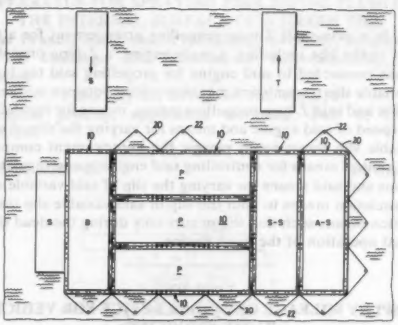
1. The combination of a cutter attachment for a sewing machine having a free end arm, the attachment comprising a block having a flat upper face and a recessed front face, the block being removably mounted on the free end of the arm, the block having a vertical bore therethrough terminating at its upper end at the junction of the recessed front face of the block and the upper face thereof, the axis of the bore being normal to the plane of the block upper face, a source of nega-

tive pressure associated with the machine and connected to the bore through the block at the lower end thereof, a cutter blade mounted on the block within the block recess, a face plate mounted over the recess in air-tight relationship to the vertical bore, a notch in the face plate extending downwardly from the upper edge thereof, the notch communicating with the upper end of the bore, the cutter blade reciprocating across the notch thereby to sever stitch chains suction-drawn down the bore and the face plate notch.

3,962,981
BARGE FACTORY

James O'Kon, Atlanta, Ga., and William Magness, Jackson Heights, N.Y., assignors to Shoreline Precast Company, New York, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,489
Int. Cl.² B63B *35/28*
U.S. Cl. 114—.5 F 6 Claims

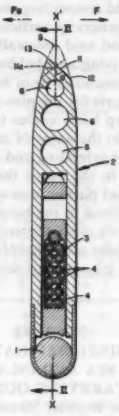


1. A factory for the manufacture of structural components for buildings and of similar large heavy objects comprising a multiplicity of separate floating barges arranged adjacent each other to provide an essentially continuous work area in which the decks of all barges are essentially level and lie substantially in a single plane, bridges connecting the decks of at least some of the side-by-side barges to each other for movement of personnel, materials and products among the several barges, material handling means for transporting materials, equipment and products from place to place in the work area and means for connecting the barges together to provide a generally stable working platform under conditions of water motion, the transfer of live loads from barge to barge and the like characterized in that the connecting means includes in combination cable ties connected between adjacent barges, the cable ties affording controlled tension to restrict relative movement of the barges in response to forces acting horizontally and to transfer horizontal forces between adjacent barges, and shear plate connector means including a structural member associated with each of the respective adjacent barges at a matching position thereon, each member having a socket, and shear plates separate from the structural members, one of the shear plates being received in the respective sockets of at least some of the matching members and bridging the juncture between at least some of the adjacent barges for providing vertical force transfer between the adjacent barges and for retaining the adjacent sides of the connected barges at essentially the same level.

3,962,982
FAIRINGS FOR CABLES FOR THE TOWING OF AN IMMERSED BODY

Jean A. R. Marchay, Bourg-la-Reine, and Andre Y. C. Lelievre, Meudon, both of France, assignors to Etat Francais, France

Filed Jan. 28, 1975, Ser. No. 544,681
Claims priority, application France, Mar. 19, 1974, 74.09161
Int. Cl.² B63B *21/00*
U.S. Cl. 114—235 F 13 Claims

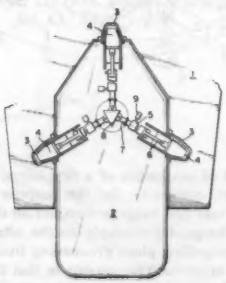


10. A method of preparing cable fairings of the type used in towing immersed objects that comprises producing a bevel on each of a number of fairings, and thereafter assembling said fairings on a cable with the bevels of adjacent fairings oppositely inclined.

3,962,983
CONNECTING STRUCTURE FOR OCEAN-GOING PUSH-BARGE

Hiromu Ono, Nishinomiya, Japan, assignor to Aoki Construction Company Limited, Osaka, Japan

Filed Mar. 25, 1975, Ser. No. 561,880
Claims priority, application Japan, Dec. 11, 1974, 49-149304
Int. Cl.² B63B *21/00*
U.S. Cl. 114—235 R 4 Claims



1. A connecting structure for an ocean-going push-barge combination which comprises, a pusher boat having a bow, sides and a stern, said pusher boat including at least three connecting pins respectively located at the bow and both sides

thereof; said connecting pin at the bow extending generally axially of the boat in a forward direction and said connecting pins on the sides of the boat extending outwardly therefrom in opposite directions and at sweep back angles inclined towards the boat's stern; said pins being slidably mounted in the boat for movement outwardly and inwardly thereof; said connecting pins being located at 120° with respect to each other; an unpowered barge having a longitudinally extending stern including a generally concave notch formed therein which extends entirely through the stern of the barge and has a configuration generally complementary to the bow of the boat to permit entrance thereinto of the bow and both sides of said pusher boat, where said connecting pins are located, said stern of the barge having generally vertically extending side walls defining the notch and said sidewalls having a plurality of ports therein for receiving and holding said connecting pins, when said pins are protruded from said pusher boat, the receiving and holding ports for the pins on the sides of the boats being located in sweep back angles towards the stern of the barge corresponding to the angle of said connecting pins, and means in said boat for extending and retracting said pins into and out of the ports in the barge that are generally aligned therewith, whereby said pusher boat and barge are adapted to be rigidly separably joined to the barge at a plurality of points on the bow and the two sides thereof to form a single ocean going unit when said pins are extended with reduced shearing force imparted to the pins during navigation.

3,962,984

METHOD OF COMBINED NAVIGATION OF A BARGE OR A LIGHTER ON SEA AND INLAND WATERS AND APPARATUS FOR CARRYING OUT THE SAID METHOD

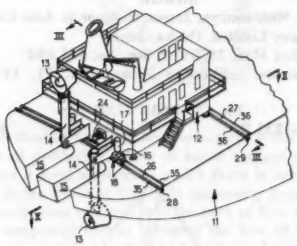
Michel Charles Marie Beghin, Meudon, France, assignor to Societe Nouvelle B.I.P.T. (Bureau International de Prestations Techniques), Ville d'Avray, France

Filed Apr. 11, 1975, Ser. No. 567,131

Claims priority, application France, Apr. 12, 1974, 74.13058

Int. Cl.² B63H *5/00*

U.S. Cl. 115—17 **9 Claims**



1. Method of navigation of a first barge on sea and/or on inland waters, consisting, for the purpose of, for example, allowing the said first barge to navigate on the sea, in securing on the said barge, for example on the after-deck thereof, a removable propelling plant proceeding from a second barge, wherein the improvement consists in that the said first barge and the said second barge are substantially joined together side by side, the said removable propelling plant is detached from the said second barge and is then subjected to a lateral displacement with respect to the said two barges until it reaches a predetermined position on the said first barge before being locked on the latter in the said predetermined position.

3,962,985

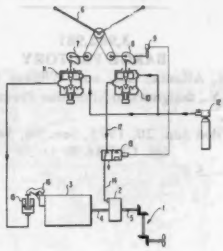
TWIN-SHAFT TYPE PROPULSION ARRANGEMENT FOR A TUG BOAT

Tadamasa Noguchi, Kawasaki; Senzou Ehata, Tokyo, and Masao Matsuura, Ageo, all of Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1975, Ser. No. 542,629

Int. Cl.² B63H *5/06*

U.S. Cl. 115—34 R **6 Claims**



1. In a twin-shaft Z-type propelling arrangement for a tug boat or the like including: a main engine, a Z-type propeller means connected to said engine for propelling said tug boat, a variable slip transmission means provided between said main engine and said Z-type propelling means, means for regulating the speed of said engine and means for varying the slip of said variable slip transmission means, the improvement comprising: control means for controlling said engine speed regulating means and said means for varying the slip of said variable slip transmission means to limit the slip of said variable slip transmission means such that slip occurs only during the dead slow speed operation of the main engine.

3,962,986

DISPLAY MILEAGE REMINDER DEVICE FOR VEHICLE PARTS SERVICING

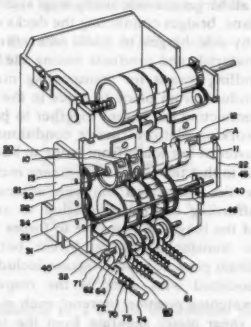
Haruyasu Fujita, Higashi-Ohizumi, and Fumio Muroya, Chofu, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 606,404

Claims priority, application Japan, Aug. 15, 1974, 49-97746; Aug. 15, 1974, 49-97747

Int. Cl.² G01C *22/00*; G01D *21/00*

U.S. Cl. 116—114 W **10 Claims**



1. In combination with a vehicle odometer including a set of digit wheels which are rotatable to register the distance traveled by the vehicle, a display device comprising:

a. at least one display wheel having service information thereon and spaced from set of digital wheels, said display

wheel including an inner member and an outer member, said outer member having a warning zone at a preselcted location on the peripheral surface thereof;

b. means for imparting the rotation of a selected one of said set of digit wheels of said odometer to said inner member that is fixed on a shaft of said display wheel so that said display wheel shaft rotates in accordance with the distance traveled by the vehicle;

c. clutch means normally connecting said inner member of said display wheel to said outer member to permit the latter to rotate with the former, said clutch means disconnecting said inner member from said outer member when the latter is locked against rotation;

d. locking means coacting with stop means located on reset means for locking said outer member of said display wheel against rotation when said warning zone thereon turns to a predetermined display position; and

e. said reset means coacting with means on the locking means and selectively to unlock said outer member of said display wheel and hence to permit the same to recommence rotation with said inner member.

3,962,987

APPARATUS FOR SPRAYING PROCESSING FLUID ON THE INTERNAL SURFACE OF A GREEN TIRE

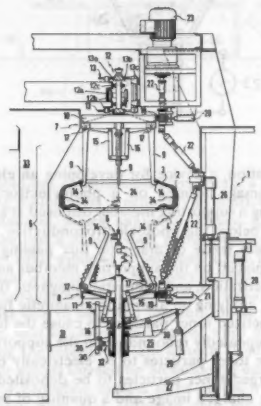
Josef Brandl, Mallersdorf-Pfaffenberg, Germany, assignor to Peter Ilmberger KG, Maschinen-u. Zahnradfabrik, Germany

Filed July 26, 1974, Ser. No. 492,018

Claims priority, application Germany, Dec. 6, 1973, 2343180

Int. Cl.² B05C 7/02

U.S. Cl. 118—44 **14 Claims**



1. An apparatus for spraying processing liquid on the interior surface of green tires having inwardly inclined sides, said apparatus comprising a spreading means for spreading the green tire as well as spray means for spraying the interior tire surface, characterized in that the spreading means includes two opposite, vertically spaced rotatably mounted grasping means for clamping the tire beads in a horizontal position, the lower of said grasping means being vertically shiftable from a lower standby position into a raised operative position for grasping one of said tire beads whereby said tire bead may be pulled downwardly, in order to spread the beads, and drive means for rotating said grasping means, said spraying means being concentrically arranged within said lower grasping means and vertically shiftable between spraying and non-spraying positions.

3,962,988

ION-PLATING APPARATUS HAVING AN H.F. ELECTRODE FOR PROVIDING AN H.F. GLOW DISCHARGE REGION

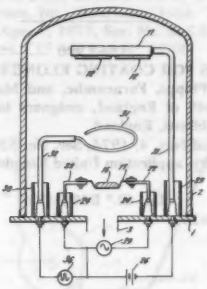
Yoichi Murayama, Tokyo; Masayuki Matsumoto, and Kunihiro Kashiwagi, both of Saitama, all of Japan, assignors to Yoichi Murayama, Nippon Electric Varian Ltd. and Koito Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Mar. 1, 1974, Ser. No. 447,260

Claims priority, application Japan, Mar. 5, 1973, 48-25883; Mar. 20, 1973, 48-32228; Nov. 30, 1973, 48-135164

Int. Cl.² C23C 13/12

U.S. Cl. 118—49.1 **17 Claims**



1. Apparatus for coating substrate with a material including: a gas-filled space, a source of said material positioned in said gas-filled space, a holder for said substrate enclosed in said gas-filled space, first means for producing a d.c. electric field between said source and said holder for carrying out the coating, and second means for heating said source to evaporate the material thereof, wherein the improvement comprises third means disposed intermediate said holder and source for producing a high-frequency electric field in a selected portion of said gas-filled space intermediate said source and said holder to provide a high-frequency glow discharge region adjacent said source for ionizing said evaporated material, whereby said ionized evaporated material is accelerated toward said holder by said d.c. electric field.

3,962,989

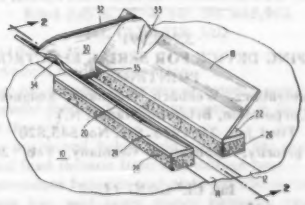
PAINT SPRAY SHIELD

James H. Groff, Sr., Box 292 New Brooklyn Rd., Sicklersville P.O., N.J. 08081

Filed Dec. 11, 1974, Ser. No. 531,691

Int. Cl.² B05C 11/00

U.S. Cl. 118—504 **8 Claims**



1. Shielding means for use with a coating applicator of the spray type for preventing the spray coating from falling upon adjacent areas, comprising:

a pair of opposing side members separated by an elongate opening, said members converging towards said opening;

first and second resilient members disposed beneath said side members at either side of said openings; and

a support member extending between said side members near one end of said opening, said support means comprising a lower segment substantially closing one end of the opening between said side members, said lower segment being curved inwardly between said side members for deflecting sprayed particles upwardly and away from said opening, and an upper portion curved downwardly toward said side members for deflecting sprayed particles downwardly toward said opening to prevent particles from being expelled upwardly between said divergent wall members.

3,962,990

APPARATUS FOR COATING ELONGATE ARTICLES

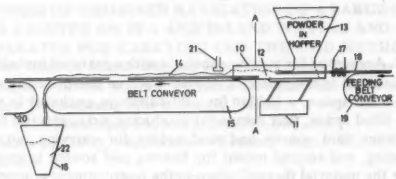
John Alastair Phipps, Farncombe, and Morris James Legg, Farnham, both of England, assignors to Plastic Coatings Limited, Guildford, England

Filed Nov. 4, 1974, Ser. No. 520,853

Claims priority, application United Kingdom, Nov. 29, 1973, 55301/73

Int. Cl.² B05C *5/00*

U.S. Cl. 118—620 **1 Claim**



1. Apparatus for externally coating an elongate article having a low thermal mass comprises a coating channel, means for supplying coating powder to the coating channel to support and immerse an article, the coating channel having a substantially V-form cross-section with opposing sidewalls which converge in the downstream sense to maintain the required depth of coating powder, means for passing the article through the coating channel to an outlet thereof, means for heating the article before it enters the coating channel, means for vibrating the coating channel, and a conveyor which passes beneath the outlet of the coating channel in a direction parallel to the coating channel wherein the conveyor is arranged to receive the article from the coating channel together with a supporting compacted bed of coating powder in which the article remains immersed.

3,962,991

DEVELOPING DEVICE FOR SERIAL ELECTROSTATIC PRINTING

Klaus Brandenburg, Wehbach, Germany, assignor to U.S. Philips Corporation, Briarcliff Manor, N.Y.

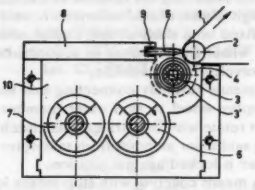
Filed Jan. 24, 1975, Ser. No. 543,820

Claims priority, application Germany, Feb. 20, 1974, 2408077

Int. Cl.² G03G *13/09*

U.S. Cl. 118—635 **5 Claims**

1. A developing device for serial electrostatic printing of alphanumeric characters on a record carrier, in which the latent image is brought into contact, immediately after the printing, with developer which is applied to the record carrier by a rotatable magnetic roller which is arranged parallel to the record carrier, wherein the magnetic roller is divided into a large number of separate magnetic regions which are succes-



sively active and non-active depending on the location of the printing head.

3,962,992

DEVICE FOR DEVELOPING AN ELECTROSTATICALLY CHARGED IMAGE

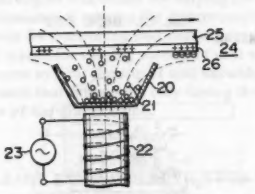
Michiyasu Takagi, Yokohama, and Toshihiko Oguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 25, 1974, Ser. No. 518,211

Claims priority, application Japan, Oct. 26, 1973, 48-119990

Int. Cl.² G03G *15/08*

U.S. Cl. 118—637 **11 Claims**



1. In combination, a device for developing an electrostatically charged image formed on a photoelectroconductive layer, comprising a supporting member disposed at a predetermined interval below the photoelectroconductive layer and including a vessel made of magnetic flux passing material, toner particles placed on the supporting member and bearing a residual magnetization, and alternating magnetic field generating means for applying an alternating magnetic field to said residually magnetized toner particles to cause the latter to be rotated, while repeatedly rebounding on the supporting member, causing the toner particles to be electrically charged to permit the charged toner particles to be deposited onto the electrostatically charged image and a quantity of said residually magnetized toner particles.

3,962,993

TEMPERATURE CONTROLLED ANIMAL HOUSE

Donald P. Dattilo, 9405 Doral Court, Louisville, Ky. 40220

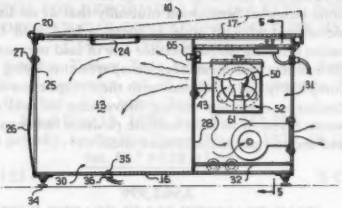
Filed Feb. 21, 1975, Ser. No. 551,593

Int. Cl.² A01K *1/00*

U.S. Cl. 119—19 **16 Claims**

15. An animal house comprising a housing, means setting off a pair of chambers in said housing, entrance means through which an animal may pass into and out of a first of said chambers, closure means openable to gain access into said chambers, heat generating means located in a second of said chambers for generating heat to heat said first chamber, means for conducting the heat generated by said heat generating means into said first chamber, first and second aperture means through said housing of said second chamber, and

conduit means connecting said heat conducting means to said first aperture means whereby air exhausted to atmosphere



through said first aperture means is replenished by air drawn into said second chamber through said second aperture means thus precluding stagnation of air in said first chamber.

3,962,994

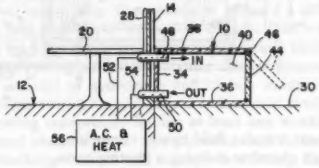
DOG KENNEL MODULE

Ahlene M. Petrucciani, Brookfield, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 7, 1975, Ser. No. 565,858

Int. Cl.² A01K *1/02*

U.S. Cl. 119—19 **1 Claim**



1. A restaurant construction comprising: a generally circular building bounded by a generally cylindrical external wall; plural restaurant tables angularly spaced apart along and adjacent the inside of said wall; plural angularly spaced apart transparent solid windows in said wall at the locations of said tables; plural angularly spaced apart transparent solid walled and roofed elongated kennel modules extending radially from the external side of said wall respectively at the locations of said tables; said windows, transparent walls and roof permitting viewing the interior of said kennels from said respective tables; door means formed on an outboard end of said kennel modules for providing ingress to or egress from said kennel modules only from said outboard end; intake and exhaust ducts communicating from the interior to the exterior of said kennel modules; and a central heating and air conditioning system feeding said ducts.

3,962,995

APPARATUS FOR TRAINING CUTTING HORSES

Durwood S. Brinson, 2323 Brownlee Rd., Bossier City, La. 71010

Filed Mar. 18, 1975, Ser. No. 559,535

Int. Cl.² A01K *15/00*

U.S. Cl. 119—29 **8 Claims**

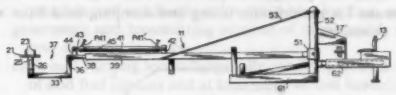
5. An apparatus for training cutting horses, comprising:

a base;

an artificial calf;

means for swiveling the calf selectively about a first vertical axis passing through the calf;

means for retracting and projecting the calf selectively relative to said base; and



means for sweeping the calf in a horizontal plane about a second vertical axis spaced from said first vertical axis.

3,962,996

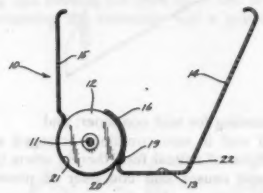
FEEDING TROUGH

Robert D. Jones, and Jerry L. Hall, both of Oskaloosa, Iowa, assignors to Intraco, Inc., Oskaloosa, Iowa

Filed Apr. 7, 1975, Ser. No. 565,859

Int. Cl.² A01K *5/00, 39/00*

U.S. Cl. 119—51 CF **2 Claims**



2. A feeder trough comprising:

an elongated bottom wall;

a first substantially upright wall connected to one side of said bottom wall;

a second substantially upright wall connected to the other side of said bottom wall;

an intermediate wall connected to said bottom wall and extending substantially upwardly intermediate the sides of said bottom wall, said intermediate wall having a plurality of openings therethrough;

a space being formed between said second wall and said intermediate wall, said space being adapted to receive an elongated conveyor member, the bottom of said space being substantially coincident to said bottom wall;

said feeder trough being of one piece sheet metal material construction and said intermediate wall being constructed of a double thickness of said material; and

said intermediate wall having a longitudinally extending crease thereon for holding said double thickness of material together, said crease being substantially aligned with the lowest level of said opening.

3,962,997

ANIMAL FEEDER

Arthur P. Ruth, P.O. Box 11037, Houston, Tex. 77001

Filed July 5, 1974, Ser. No. 485,982

Int. Cl.² A01K *5/02*

U.S. Cl. 119—51.11 **4 Claims**

1. An Animal feeder comprising:

a storage bin adapted to receive and store a supply of granular animal feed and having an opening in the lower portions thereof;

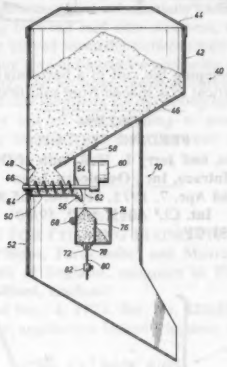
a plate positioned below said opening for accumulating animal feed thereon from said storage bin;

an auger means between said plate and the opening in said storage bin, said auger means having a set of flights thereon for agitating animal feed;

raised side means adjacent to said plate on opposite sides of said auger means for capturing animal feed therebetween, said auger means being positioned to agitate animal feed on said plate;

a fillable container having a specified capacity below an edge of said plate to receive and store animal feed falling from said plate;

means for periodically tilting and dumping feed from said container;



a pivot mounting for said container; and

an internal wall in said container arranged such that an accumulaton of animal feed therein alters the center of gravity and causes said container to pivot about said pivot.

3,962,998

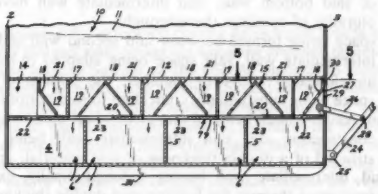
LIMITED FEEDER FOR FARM ANIMALS

Delmar J. Lynch, Burbank, S. Dak. 57010

Filed Jan. 10, 1975, Ser. No. 540,133

Int. Cl.² A01K *5/00*

U.S. Cl. 119—56 R **5 Claims**



1. In a feeder, in combination:

a hopper having at least one outlet opening in the bottom thereof;

a guideway spaced below said hopper having at least first and second discharge openings in the bottom thereof longitudinally spaced in opposite directions from a location directly below said outlet opening; a distributor slide mounted for longitudinal movement on the bottom of said guideway in the space between the bottom of said hopper and the bottom of said guideway, and having at least first and second adjacent, longitudinally aligned topless and bottomless measuring compartments defined by longitudinal walls and transverse panel like partitions, said transverse partitions being supported on relatively thin lower edges to minimize the contact area with said guideway in which feed material may accumulate; and

means for reversibly removing said slide longitudinally in said guideway between a first position, in which said first compartment is under said outlet opening and said second compartment is over said first discharge opening, and a second position, in which said first compartment is over said second discharge opening, and said second compartment is under said outlet opening, so that at the end of each movement of the slide one of the compartments is being filled from said hopper and the other compartment is emptying;

said outlet and discharge openings and said transverse partitions being so positioned mutually that at no time in the movement of said slide is there a free path from said outlet opening through either one of said measuring compartments; said measuring compartments being disposed completely out of register with their respective outlet and discharge openings during movement of said compartments through an intermediate position between said first and second positions of said slide.

3,962,999

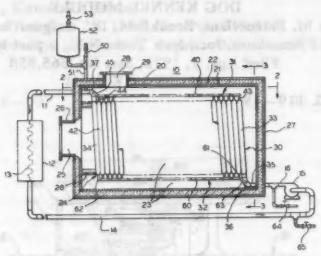
HEAT TRANSFER FLUID HEATER WITH CONTINUOUSLY FLUSHED VENT AND DRAIN

Gustav A. Rehm, Milwaukee, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Sept. 9, 1974, Ser. No. 504,495

Int. Cl.² F22B *37/12*

U.S. Cl. 122—248 **22 Claims**



22. A heat transfer fluid heater comprising:

a furnace chamber defining a heating zone,

helical coil means formed of a tubular material and having a plurality of loops arranged between an inlet loop and outlet loop,

said coil have upper and lower portions, said coil being constructed and arranged for conducting fluid to absorb heat from said heating zone and said coil having an outlet means connected to said oulet loop for discharging heated fluid and inlet means connected to said inlet loop for returning fluid from which heat has been extracted,

pump means external of said heating zone and having an outlet communicated with said inlet means and having an inlet for receiving returned fluid, and

vent conduit means disposed above said coil means and having an outlet in communication with said coil outlet means and a plurality of spaced apart inlets each respectively connected to the upper portion of one coil loop to provide a first flow path parallel to said coil means for continuously flowing through said vent conduit means a proportionate part of the fluid that is delivered to said coil means to thereby continuously flush said vent conduit means,

drain conduit means disposed below said coil means and in communication with said coil inlet means for receiving fluid at from said pump outlet, said drain conduit means having a plurality of spaced apart outlets each respectively connected to the lower portion of one coil loop to provide a second flow path parallel to said coil means for continuously flowing through said drain conduit means a proportionate part of the fluid delivered to said coil means to thereby continuously flush said drain conduit means,

said vent conduit means and said drain conduit means being configured nonlinearly between the respective points of

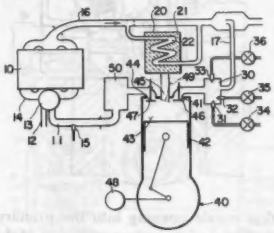
connection with said coil loops to permit expansion and contraction of said vent and drain conduit means.

3,963,000

SYSTEM FOR REFORMING ENGINE FUEL INTO HYDROGEN GAS-CONTAINING MIXTURE BY CATALYTIC REACTION

Katuaki Kosaka, Tokyo; Zene Ueno, Fuchu, and Tadahiko Nagaoka, Tokorozawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 19, 1974, Ser. No. 534,290
Claims priority, application Japan, Mar. 6, 1974, 49-25915
Int. Cl.² F02B *43/08*
U.S. Cl. 123—3 **8 Claims**



1. A system for the preparation of a fuel mixture to feed into an engine, comprising: first means to prepare a substantially gaseous first mixture at least of an organic fuel, oxygen and water; a reaction chamber containing therein a catalyst capable of converting said first mixture into a gaseous second mixture at least of hydrogene and carbon monoxide at elevated temperatures; second means to heat said catalyst; and a reciprocating compressor having at least one working chamber defined above a piston and provided with an intake valve and a discharge valve; said compressor being fluidly connected with said first means, said reaction chamber and the engine such that both said first means and the engine communicate with said reaction chamber through said working chamber, said compressor being constructed such that said first mixture is compressed in said working chamber and subsequently forced out into said reaction chamber to enhance the efficiencies of the reactions in said reaction chamber, and that said second mixture is drawn into and expanded in said working chamber to reduce the temperature of said second mixture and sustain the operation of said compressor, and subsequently discharged therefrom to the engine.

3,963,001

COMBUSTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Perry Lester Kruckenberg, Los Angeles; Harld Elden Anderson, Redondo Beach, and Ray Lavette Carlson, Lake San Marcos, all of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Continuation of Ser. No. 93,269, Nov. 27, 1970, abandoned, and a continuation-in-part of Ser. No. 739,434, June 24, 1968, Pat. No. 3,543,735. This application Dec. 8, 1972, Ser. No. 313,528
Int. Cl.² F02B *19/16, 3/00*
U.S. Cl. 123—32 D **16 Claims**

1. A method of effecting combustion in internal combustion engines said method comprising:

generating, within engine means, and in energy communicating relation with piston means movable in cylinder means of said engine means, a plurality of generally mutually distinct burning loci, with said burning loci defining generally spaced centers of burning;

concurrently, and during a working stroke of said piston means of said engine means,

transmitting combustion supporting gas, heated by compression and combustion, into said burning loci, and

generating and transmitting streams of combustible fuel into said burning loci,

each said burning loci substantially receiving at least one of said fuel streams and at least some of said heated gas;

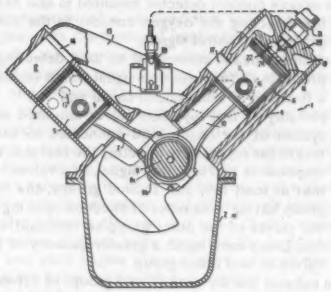
limiting the time duration of the generation of said fuel streams so that at least the majority of fuel in said streams passes into said burning loci during a working stroke of said piston means;

providing a plurality of spaced wall means, with each said wall means peripherally confining and defining

a fuel and heated gas agitation zone individually associated with and communicating with a said burning loci;

each said peripherally confined agitation zone and a burning loci associated therewith receiving fuel from at least one fuel stream directed thereinto during said working stroke of said piston means;

prolonging and evening the burning of fuel in said streams by maintaining the existence and a generally discrete



relation of said burning loci during said working stroke of said piston means;

utilizing energy generated through operation of said burning loci to induce said working stroke of said piston means;

said spaced wall means defining a plurality of discrete and spaced flow path means operable during said working stroke of said piston means to receive said majority of fuel and maintain separate flows of said fuel leading individually to said burning loci, with each flow separately communicating with a said burning loci;

said plurality of discrete and spaced flow path means including said agitation zones, and defining the location of, and being operable in part to generate, said generally mutually distinct burning loci;

said plurality of flow path means being cyclically operable to receive said streams of fuel and permit the passage of said majority of fuel into said burning loci during working strokes of said piston means, concurrent with the passage of said combustion supporting gas therethrough into said burning loci; and

said fuel streams being individually directed so as to pass directly into said flow path means during said working strokes of said piston means, for transmittal directly into said burning loci.

3,963,002

ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM

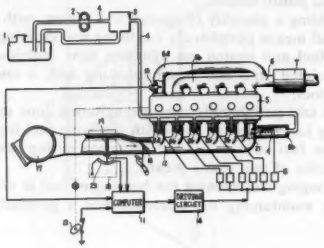
Motoharu Sueishi, Kariya, and Susumu Harada, Obu, both of Japan, assignors to Nippondenso Co., Ltd., Aichi, Japan

Filed Sept. 9, 1974, Ser. No. 504,248

Claims priority, application Japan, Sept. 14, 1973, 48-104429

Int. Cl.² F02B 3/00

U.S. Cl. 123—32 EA **2 Claims**



1. An electronically controlled fuel injection system for an engine exhaust system comprising

an oxygen content detector mounted in said exhaust system for detecting the oxygen content in the exhaust gas to generate a control signal,

computer means connected to said detecting means for producing a fuel injection signal which varies in length as a function of said control signal and

a plurality of fuel injection valves mounted on the intake system of the engine and connected to said computer means for repetitively injecting the fuel into the engine in response to said injection signal, said valves being divided into at least first and second groups, the valves in one group having a diameter of injection opening greater than the valves of the other group so that said valves in said one group each inject a greater quantity of fuel than the valves of said other group

an exhaust line for each of said groups of valves with one of said lines mounting said oxygen content detecting means so that said detecting means produces said control signal as a function of the ratio in that line, thereby controlling the overall air-fuel ratio at a different set value from the theoretical one.

3,963,003

COMBUSTION CHAMBER ARRANGEMENTS FOR I.C. ENGINES

Diarmuid Downs, Hove, England, assignor to Ricardo & Co. Engineers (1927) Ltd., Shoreham-by-Sea, Sussex, England

Filed June 3, 1974, Ser. No. 475,919

Claims priority, application United Kingdom, June 5, 1973, 26855/73

Int. Cl.² F02B 3/00

U.S. Cl. 123—32 K **7 Claims**

1. An internal combustion engine of the spark-ignited gasoline fuel injection type having

a cylinder block formed with one or more cylinders,

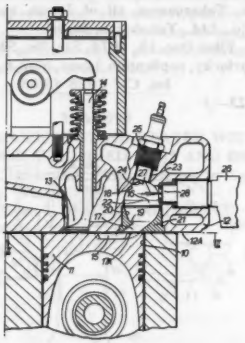
a piston reciprocable in each cylinder,

a cylinder head,

a primary ignition chamber associated with each cylinder and formed in the cylinder head,

a throat through which a substantial part of the air charge drawn into the cylinder on each suction stroke of the piston is forced during each subsequent compression stroke into the chamber, and of which one end opens into the cylinder opposite a shallow recess in the upper surface of the piston crown while the other end opens obliquely into the chamber so that the charge entering the chamber rotates about an axis through the central portion of the chamber, the bottom of the chamber being formed in a plug member inserted in the cylinder head, the total top dead centre clearance being such as to provide a compression ratio not exceeding 12.1:1,

a spark ignition plug projecting into the upper part of the primary ignition chamber,



a fuel injection nozzle opening into the primary ignition chamber at a point of its surface upstream of the ignition plug and downstream of the throat with respect to the direction of rotation of the charge in the chamber,

means for injecting the whole of the gasoline fuel through the injection nozzle into the primary ignition chamber during the compression stroke, and

means for producing a spark at the sparking plug to ignite the swirling mixture of the said gasoline and the air with the air driven into the primary chamber through the throat.

3,963,004

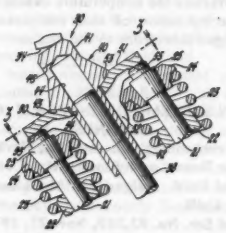
TWO-PIECE VALVE BRIDGE

Glenn W. Lysinger, Detroit, and James S. Sears, Fowlerville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 8, 1975, Ser. No. 575,609

Int. Cl.² F01L 1/18

U.S. Cl. 123—90.4 **3 Claims**



1. A multi-valve actuating bridge assembly for an internal combustion engine of the type having a cylinder head, a pair of valves including stems slidably received through guide sleeves fitted into the cylinder head, a guide rod fixed to the cylinder head and a rocker arm pivotally mounted in spaced relation from the stems of the valves, said bridge assembly including a guide having a shank slidable on the guide rod, a head engageable by the rocker arm and a semi-spherical shoulder therebetween and, a bridge comprising a web having valve stem engaging end portions, a semi-spherical saddle portion in said web intermediate said end portions, a circular

aperture through said semi-spherical saddle portion of said web concentric therewith and depending sides integrally connected to said web on opposite sides thereof, said shank extending through said aperture with said web positioned so that said semi-spherical saddle portion of said bridge socketably receives said semi-spherical shoulder of said guide.

3,963,005

FUEL SUPPLY SYSTEM

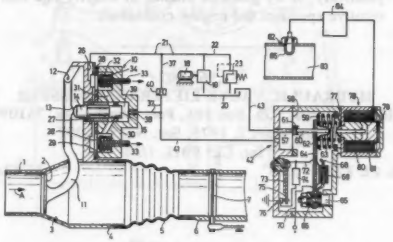
Konrad Eckert, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 2, 1974, Ser. No. 511,360

Claims priority, application Germany, Oct. 12, 1973, 2351203

Int. Cl.² F02M 7/18

U.S. Cl. 123—119 R 4 Claims



1. In a fuel supply system for mixture compressing, externally ignited internal combustion engines including: an induction tube; an air-flow measuring member disposed in the induction tube; an arbitrarily settable butterfly valve mounted within the induction tube in series relation with the air-flow measuring member; a fuel metering and distribution valve assembly containing a fuel metering control slide; connecting means connecting the air-flow measuring member to the control slide thereby transmitting the motion of said air-flow measuring member due to air flowing into the induction tube into axial motion of the control slide; means for conveying pressurized fluid to one side of said control slide so as to exert a force to oppose the axial motions of the control slide; and pressure control valve means including heatable, insulated bi-metallic spring means, electrically heated bracket means connected to said bi-metallic spring means for heating the same, control spring means, whereby the force of said bi-metallic spring means can oppose the force of said control spring means, the improvement comprising:

a. secondary spring means, disposed in said pressure control valve, in substantially parallel relation to said control spring means whereby the force of said bi-metallic spring means can oppose the force of said secondary spring means;

b. support means serving as a common support for both said control spring means and said secondary spring means; and

c. means connected to said secondary spring means for directly varying the compression of said secondary spring means and indirectly varying the compression of said control spring means through said support means in dependence on the magnitude of one or more engine parameters, such that the magnitude of the force to oppose the axial motions of the control slide is increased when the compression of both the control spring means and the secondary spring means is increased and decreased when the compression is decreased.

3,963,006

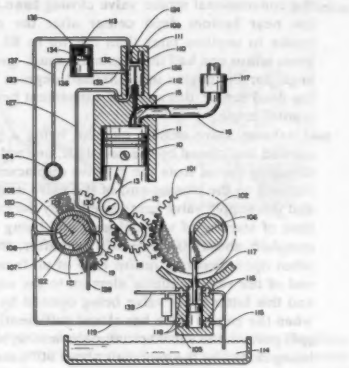
OIL FLOW POSITIVE VALVE DRIVE MECHANISM FOR GASOLINE ENGINES

Joseph Carl Firey, 1554 NE. 95th St., Seattle, Wash. 98115

Filed Sept. 3, 1974, Ser. No. 502,962

Int. Cl.² F01L 9/02

U.S. Cl. 123—90.12 5 Claims



1. The combination of a conventional four stroke cycle gasoline engine, with conventional intake valves and exhaust valves, wherein the improvement comprises replacing the usual torque controlling throttle plate and the conventional intake valve and exhaust valve driving mechanisms with oil flow, positive valve drive mechanisms, said oil flow positive valve drive mechanism comprising, positive displacement oil pump elements one such pump element for each engine intake valve and at least one such pump element for each set of four engine exhaust valves, valve opening elements, valve closing elements, valve actuator elements, and oil reservoir elements, a separate valve opening element and valve closing element and valve actuator element being required for each engine intake valve and each engine exhaust valve, at least one oil reservoir element being required for an engine;

said positive displacement oil pump element being positively driven from an engine shaft so as to positively displace oil via the valve opening element into the opening end of the valve actuator to positively open the engine valve at the proper time relative to the engine piston motion and also so as to positively displace oil via the valve closing element into the closing end of the valve actuator to positively and fully close the engine valve at the proper time relative to the engine piston motion, the displacement of said positive displacement oil pump element being in excess of 4 and preferably in excess of 10 times the valve actuator displacement needed to open the valve and to close the valve, the excess oil thus displaced being directed via spill ports in the valve actuator element into the oil reservoir element and, via the relief ports therein, into the engine oil supply system, said positive displacement pump element being fitted with overpressure relief valves which spill oil back to the sump whenever a pump discharge passage is blocked;

said valve opening element being a pair of valves opened and closed by the camshaft, one valve when open directing the oil from the positive displacement oil pump element to the opening end of the valve actuator element and this supply valve being opened by the camshaft at the time of starting of valve opening and being closed by the camshaft about 90° camshaft thereafter, the other valve when open directing return flow of oil from the closing end of the valve actuator element to the engine oil sump and this latter relief valve being opened by the camshaft when the engine valve has opened sufficiently to cause

the spill ports in the valve actuator element to be covered and being closed by the camshaft about 90° camshaft thereafter;

said valve closing element being of two different kinds, an exhaust valve closing element, used for the closing of the engine exhaust valves, and an intake valve closing element, used for the closing of the engine intake valves at times adjustable, via an engine torque control lever, from the conventional intake valve closing time at engine piston near bottom dead center after the engine intake stroke to anytime later than this up to 85 camshaft degrees minus one half the maximum spark ignition advance angle for the engine in crankshaft degrees before piston top dead center, this angle of adjustment being the torque control angle;

said exhaust valve closing element being a pair of valves opened and closed by the camshaft, one valve when open directing the oil from the positive displacement oil pump element to the closing end of the valve actuator element and this supply valve being opened by the camshaft at the time of starting of valve closing and being closed by the camshaft about 90° camshaft thereafter, the other valve when open directing return flow of oil from the opening end of the valve actuator element to the engine oil sump and this latter relief valve being opened by the camshaft when the engine valve has closed sufficiently to cause the spill ports in the valve actuator element to be covered and being closed by the camshaft about 90° camshaft thereafter;

said intake valve closing element being of the same description as the aforedescribed exhaust valve closing element except in that those portions of the supply valve and the relief valve which do not move integrally with the camshaft are secured to the torque control lever and are angularly adjustable with respect to those portions of the supply valve and the relief valve which do move integrally with the camshaft by adjustment of this torque control lever through the previously described torque control angle, said portions of the supply valve and the relief valve which do not move integrally with the camshaft being fitted with connection means which assure maintenance of connections between the portions of the supply valve and the relief valve which do not move integrally with the camshaft and the appropriate supply and delivery connections from the positive displacement oil pump element, to and from the valve actuator element and to the engine oil sump, throughout the full adjustment of the portions of the supply valve and the relief valve which do not move integrally with the camshaft through the torque control angle;

said valve actuator element being a double acting, piston and cylinder actuator with the piston secured to the valve, and the cylinder secured to the engine block and fitted with pressure supply and relief connections at both ends and spill ports in the center which connect to the oil reservoir element, said spill ports being uncovered as the piston reaches the end of its travel to open the valve and to close the valve, cushion pistons and cylinders being fitted interally to the actuator cylinder and piston so as to slow down the velocity of the valve as it nears the fully open and fully closed positions, these cushion pistons being fitted with by pass passages and check valves which permit full application of oil pressure from the positive displacement oil pump element to the entire actuator piston area;

said oil rservoir element being a closed cylindrical cavity with a spring loaded reservoir piston acting to maintain a high pressure within the reservoir, this high pressure acting via a connection to the actuator spill ports to hold the engine valve open when once opened and to hold the engine valve closed when once closed, the reservoir absorbing the excess flow of the positive displacement oil pump element which comes out the actuator spill ports when the engine valve is fully opened and when the engine valve is fully closed, said excess flow moving the reservoir piston against its spring until the reservoir piston has moved sufficiently to uncover a relief port in the reservoir cylinder, after which the excess flow passes via the relief port into the engine oil supply system, the reservoir cylinder being fitted with piston stops which assure that the piston spring always has a preset compression corresponding to that reservoir pressure adequate to hold the engine valve open and closed;

the engine valve driving portion of the engine camshaft consisting of the several drive mechanisms for driving the positive displacement oil pump elements, the portions of the supply valve and the relief valve of the valve opening elements which move integrally with the camshaft, the portions of the supply valve and the relief valve of the valve closing elements which move integrally with the camshaft, all of these being angularly positioned on the camshaft as to open and close the several engine exhaust valves and engine intake valves at the desired time relative to the engine pistons when the camshaft is driven positively, as by gears or chains, at exactly one half the rotative speed of the engine crankshaft.

3,963,007

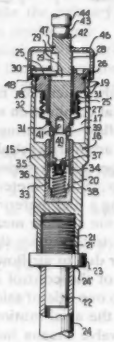
HYDRAULIC VALVE LIFTER OR ADJUSTER

Weldon S. Baker, P.O. Box 106, Fort Worth, Tex. 76109

Filed Mar. 7, 1975, Ser. No. 556,097

Int. Cl.² F01L 1/34

U.S. Cl. 123—90.16 **15 Claims**



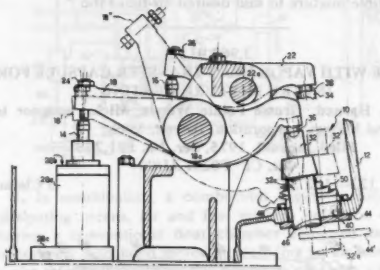
1. In a hydraulic valve lifter for engines and the like, a housing having a fluid reservoir chamber and a bore leading from said chamber, a cap element secured fixedly to the housing and projecting into said chamber and having a bore, a fluid sealing element interposed between the cap element and said chamber, a driver extending through the bore of the cap element and adapted to slide axially therein, a fluid sealing flexible bellows having opposite ends secured to the cap element and a lower end portion of the driver and allowing essential axial relative movement between the driver and cap element, valve lifter means disposed within the bore of the housing which leads from said chamber and including a spring-urged plunger engaged with a lower end portion of the driver, visual indicator means on the upper end portion of the housing, and cooperating indicator means carried by the driver exteriorly of the housing, said housing and driver adapted for connection with push rod elements of engine valve opening mechanism.

3,963,008

METHOD OF REMOVING A VALVE MOUNTED IN AN INTERNAL COMBUSTION ENGINE CYLINDER-HEAD AND ACTUATING DEVICE FOR CARRYING OUT THE SAID METHOD

Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Oct. 8, 1974, Ser. No. 513,071
Claims priority, application France, Nov. 9, 1973, 73.39989
Int. Cl.[2] F01L 1/14
U.S. Cl. 123—90.61 4 Claims



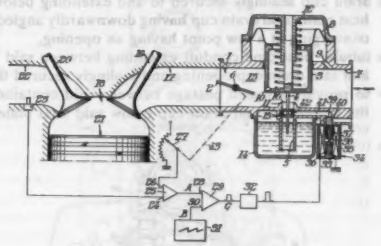
1. In an internal combustion engine including: at least one cylinder head; at least one overhead poppet valve mounted in said cylinder head; a rocker-arm swingingly mounted on said cylinder head and having a drive end freely engaging in releasable relationship the top end of the valve stem and an opposite driven end; and a reciprocable push-rod means enclosed within and projecting upwards from a tubular housing forming a standpipe means, said push-rod means co-operating through its top end in freely fitting and disconnectable relationship with said driven end of said rocker-arm, said push-rod means and stand-pipe assembly means extending upwards with clearance through an opening means formed in said cylinder head; and locking means covering said opening means and removably secured to said cylinder head in engaging relationship with said stand-pipe means to hold same against motion and keep it in substantially registering relation to said driven end of said rocker-arm, the improvement consisting in that said valve is removable upwards from said cylinder head; said drive end of said rocker-arm is provided with an axially adjustable set screw means through the bottom end of which said drive end engages said valve stem, whereas said screw means is, by being unscrewed, retractable upwards relative to said rocker-arm to an extent allowing said driven end of the latter to be disengaged from said push-rod upon tilting said rocker-arm towards said valve; said push-rod means and stand-pipe assembly means being displaceable sidewise in an unconstrained condition; said opening means is of elongated shape for providing said clearance which is large enough for enabling said push-rod means and stand-pipe means assembly, upon retracting said set screw means, tilting said rocker arm and releasing said locking means, to be shifted sidewise away from below said driven end of said rocker-arm so as to clear the path of travel thereof, whereby said drive end of said rocker-arm may, through reverse tilting of the latter, be moved out of the removal way of said valve.

3,963,009

CARBURATION DEVICES FOR INTERNAL COMBUSTION ENGINES

Francois Mennesson, Nanterre, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., France

Filed Apr. 26, 1974, Ser. No. 464,443
Claims priority, application France, May 4, 1973, 73.16218
Int. Cl.[2] F02M 7/00
U.S. Cl. 123—119 D 8 Claims



1. A carburation device for internal combustion engines, comprising: an induction pipe; driver actuated main throttle means in said pipe; auxiliary throttle means located in said induction pipe upstream of said main throttle means and which automatically and progressively open in proportion to the increase in the flow rate of air in said induction pipe; a source of fuel at substantially atmospheric pressure; conduit means for delivery of fuel from said source to a portion of said induction pipe between said main throttle means and auxiliary throttle means; metering means operatively connected to said auxiliary throttle means and metering the flow rate of fuel in said conduit means wherein an air flow section determined by the auxiliary throttle means is in proportion to a fuel flow section metered by said metering means and the mixture of air and fuel delivered to said induction pipe has a substantially constant richness during normal operation; a solenoid valve which, in energized conditions, fully opens an air path to said fuel conduit means and under de-energized conditions fully closes the path; and means responsive to a parameter of the engine exhaust gas and which repetitively energizes the solenoid valve for a fraction of the repetition period which is such that the total time during which the valve is fully open during a predetermined time duration is adjusted in dependence on said exhaust gas parameter.

3,963,010

ENGINE WITH FAST WARM UP HEAT PIPE MIXTURE HEATING

John L. Harned, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 30, 1975, Ser. No. 591,275
Int. Cl.[2] F02M 31/00
U.S. Cl. 123—122 AC 5 Claims

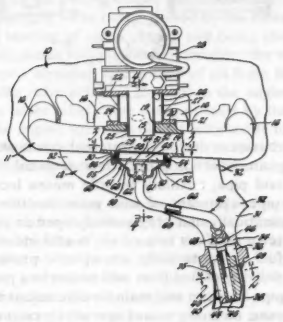
1. In combination with an internal combustion engine
an intake manifold having a generally horizontal inlet mixture passage and means for mounting a carburetor on said manifold above said passage, said mounting means defining an inlet opening in an upper portion of said passage,
an exhaust manifold having an exhaust gas passage extending to a level below said inlet manifold passage and
heat pipe means for transferring heat between said exhaust passage and said inlet passage, said heat pipe means comprising
a boiler in said exhaust passage and including an elongated container formed of heat conductive material capable of withstanding maximum exhaust gas temperatures, said container extending generally lengthwise of said exhaust passage and having a plurality of heat absorbing fins along

the outer surface thereof and extending generally along the line of gas flow within said exhaust passage,

a heat plate mounted in said manifold and forming a portion of the bottom wall of said inlet passage opposite the position of said inlet opening so as to intercept fuel droplets entering said inlet passage through said opening, said heat plate being formed of thin heat conductive material of low mass and secured in an opening in the wall of said manifold passage by means which limit the transfer of heat from said heat plate directly to the manifold walls,

a drain cup sealingly secured to and extending below said heat plate, said drain cup having downwardly angled walls converging at a low point having an opening,

a tubular heat pipe conduit extending between said boiler and said drain cup opening and sealingly secured thereto to provide a sealed passage between said container and the interior of said drain cup below said heat plate,



a limited mass of vaporizable heat transfer fluid within said sealed passage and its connected volumes, a mass of inert gas within and pressuring said sealed passage and its connected volumes to establish a predetermined range of vaporization temperatures for said heat transfer fluid,

wick means extending within said tubular conduit and into said container and adapted to separate the interior thereof into two flow paths comprising a larger path for the flow of vapor upwardly from said boiler to said drain cup and a smaller capillary path for the downward flow of liquid from said drain cup to said boiler, and

a nozzle extending upwardly from said drain cup opening to carry upward flowing vapor above the level of liquid condensate in said drain cup and direct such vapor against the lower surface of said hot plate.

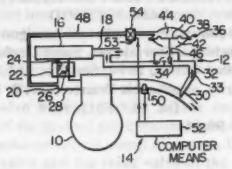
3,963,011

METHOD AND DEVICE FOR ADJUSTING ENGINE EXHAUST GAS RECIRCULATION CONTROL

Masaaki Saito, and Hidehiro Minami, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 25, 1974, Ser. No. 491,939
Claims priority, application Japan, July 26, 1973, 48-84272
Int. Cl.² F02N *25/06*
U.S. Cl. 123—119 A **6 Claims**

1. A method of maintaining the flow rate of engine exhaust gas recirculated into an intake system of an internal combustion engine at a desired ratio to the flow rate of air drawn into said engine, comprising the steps of sensing the actual air-fuel ratio of a combustible mixture supplied to an internal combustion engine, comparing said sensed actual air-fuel ratio with a desired air-fuel ratio which corresponds to a desired ratio of the flow rate of engine exhaust gas recirculated into an intake system of said engine to the flow rate of air drawn into said engine, and adjusting the flow of said engine exhaust gas in accordance with the difference between said sensed actual air-fuel ratio and said desired air-fuel ratio to adjust the flow rate of said engine exhaust gas to said desired ratio to the flow



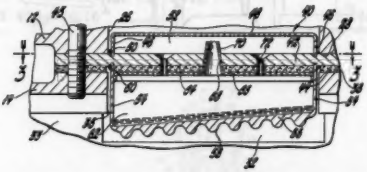
rate of said air concurrently adjust the air-fuel ratio of said combustible mixture to said desired air-fuel ratio.

3,963,012

ENGINE WITH VAPOR HEAT TRANSFER CAPSULE FOR INTAKE MIXTURE HEATING

John L. Harned, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 30, 1975, Ser. No. 591,273
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AC **3 Claims**



1. A vapor heat transfer capsule in combination with an internal combustion engine to transfer heat from gases in the exhaust manifold to mixture in the intake manifold, said capsule comprising

a heat conducting plate secured between opposed flanges of the intake and exhaust manifolds of said engine,

first enclosure means having bottom and side walls sealingly secured to the bottom of said plate and forming therewith a boiler chamber beneath the plate and adapted to contain a quantity of vaporizable fluid,

second enclosure means having top and side walls sealingly secured to the top of said plate and defining a condenser chamber above said boiler chamber and separated therefrom by said plate, said top and side walls being formed of thin walled heat conductive material of relatively low mass,

nozzle means extending through and above said plate and defining a passage for directing vapor passing from the boiler chamber into the condenser chamber against the upper wall of said second enclosure means, said nozzle means further defining a dam preventing condensate collected on said plate upper surface from returning to the boiler chamber through said nozzle passage,

a plurality of small capillary passages extending through said plate to connect said condenser and boiler chambers, said capillary passages acting to return condensate collected on said plate upper surface to said boiler chamber, and

a limited quantity of vaporizable fluid sealed within said chambers, said fluid having a predetermined boiling temperature between the desired inlet fuel mixture temperature and the normal exhaust gas temperatures and below the temperature at which substantial breakdown of the fuel in the intake manifold mixture is likely to occur.

3,963,013

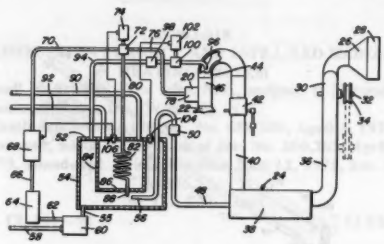
AIR AND FUEL CHARGE FORMING DEVICE

Elmo C. Authement, 103 Nicholls Drive; Gasper G. Varvaro, Box 514, Rte. 2, both of Thibodaux, La. 70301; Frank S. Stupka, Box 142, Rte. 2, Bogalusa, La. 70427; Obierge J. Waguespack, 1020 People St.; Sidney J. Tabor, Box 630-P, Rte. 1, both of Thibodaux, La. 70301, and Mario R. Guell, 617 W. Third St., Bogalusa, La. 70427

Filed July 23, 1974, Ser. No. 490,924

Int. Cl.² F02M *17/18*

U.S. Cl. 123—133 10 Claims



1. In combination, a combustion engine including heat dissipating means, air and fuel mixture induction passages having a conventional float chamber equipped carburetor operatively associated therewith including an air inlet and an outlet communicated with said induction passages, a supply of liquid fuel under pressure communicated with said float chamber, a supplemental air and fuel charge forming device, said device including an evaporator chamber including an inlet and an outlet, an air intake, first conduit means for ducting a first portion of air entering said intake into the interior of said chamber, second conduit means for ducting the remaining portion of air entering said intake to said carburetor inlet, third conduit means opening outwardly from said chamber and including an outlet communicated with said carburetor inlet, said engine heat dissipating means including means for heating substantially all of the air entering said air intake, pipe means communicating said supply of fuel under pressure with the carburetor float chamber and with the interior of said evaporator chamber for the discharge of liquid fuel into said evaporator chamber to be rapidly vaporized by the first portion of intake air discharged into said evaporator chamber, and valve means operatively associated with said pipe means for selectively communicating said supply of fuel under pressure with said carburetor float chamber and the interior of said evaporator chamber.

3,963,014

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Heinrich Staudt, Markgroningen-Talhausen; Wolfgang Eckell, Gebersheim; Hartmut Lehmann; Karl Sontheimer, both of Stuttgart, and Eberhard Hofmann, Kirchberg-Murr, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

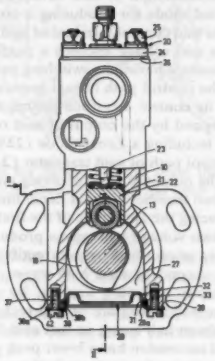
Filed Sept. 24, 1974, Ser. No. 508,892

Claims priority, application Germany, Oct. 2, 1973, 2349366

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 R 9 Claims

1. In a fuel injection pump for internal combustion engines, especially multi-cylinder serial pumps which include pump pistons driven by a cam shaft via cam means, the pump having a chamber within its housing which is in the shape of an elongated recess having side walls, frontal walls and an opening, a single cover over the opening and a sealing means between the housing and the cover, the sealing means including an O-ring, having first and second portions which is tightened between an offset on the circumference of the cover and a seat, defined by a receiving bore, in a region between the chamber and the outer surface of the housing, the improvement comprising two sections of said offset extending in the longitudinal direction of said cover and said seat including two step-shaped extensions, first portions of said O-ring being positioned parallel to said two sections adjacent said extensions, said O-ring being



primarily axially stressed in the direction of fastening of said cover between said cover and said extensions; second regions of said O-ring being positioned adjacent said frontal walls and being primarily radially stressed between said cover and said frontal walls; whereby said step-shaped extensions and said frontal walls define transition regions and portions of said O-ring lying adjacent said transition regions are stressed both axially and radially.

3,963,015

SIMPLIFIED AUTOMATIC ADVANCE IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

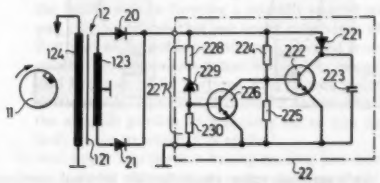
Georg Haubner, Berg; Walter Hofer, and Werner Meier, both of Schwabach, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 4, 1973, Ser. No. 421,539

Claims priority, application Germany, Dec. 14, 1972, 2261156

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 CC 2 Claims



1. An ignition system for an internal combustion engine comprising:

a magneto generator driven by the engine and having an ignition circuit armature and windings thereon wound in the form of a built-in spark coil comprising primary and secondary windings;

at least one spark plug connected in circuit with said secondary winding;

electronic circuit means, connected in parallel with at least part of said primary winding and including full wave rectifying means for rectifying the output voltage of said primary winding, said electronic circuit means including

also the switching path of a semiconductor switch arranged in series with a similarly poled diode in a circuit branch substantially short-circuiting said primary winding through said rectifying means except when said semiconductor switch is turned off by a control pulse on a control electrode thereof, said electronic circuit means further including a transistor (226) responsive to the voltage across the combination of said switching path and said similarly poled diode for producing a control pulse and applying it to said control terminal of said semiconductor switch when said voltage exceeds a predetermined voltage, said transistor having its switching path connected in parallel to the control path of said semiconductor switch and having its control electrode connected to a voltage divider energized by the output of said rectifying means and further including a Zener diode (229) so connected that the control path of said transistor (226) is not energized until the output of said rectifying means overcomes the breakdown threshold of said Zener diode (229), and

means for reducing the amplitude of the first of a succession of at least two voltage half waves produced in said primary winding as rectified by said rectifying means, relative to the second of said half waves, said amplitude reducing means including loading, by electrical resistance, of the half wave path of said rectifying means for said first voltage half wave, so that said first voltage half wave of said succession has a lower peak voltage than the immediately succeeding voltage half wave,

whereby at low speeds of said engine, said shortcircuiting circuit branch is not interrupted during said first voltage half wave of said succession, but is interrupted by the second voltage half wave of said succession.

3,963,016
VALVE CHESTS.

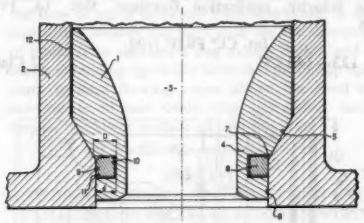
Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques - S.E.M.T.E., Saint Denis, France

Filed Jan. 13, 1975, Ser. No. 540,503

Claims priority, application France, Jan. 29, 1974, 74.02899

Int. Cl.² F01L 3/00

U.S. Cl. 123—188 S **2 Claims**



1. An overhead valve chest for an internal combustion engine, comprising a portion of cylindro-conical shape adjacent to a lower bearing seat of said valve chest for seating within a cylinder head of the engine said valve chest further comprising an annular groove formed in the said cylindro-conical portion and having a flat upper wall and an opposite flat lower wall, a sealing ring mounted into said groove and having an outer cylindrical surface in continuous bearing engagement on a corresponding inner cylindrical surface of the cylinder head, said groove being formed in overlapping relation to said cylindro-conical portion so that the diameter of the said flat upper wall of the groove is larger than that of the laid flat lower wall of the groove, said larger upper wall being situated on the side of the cylinder head which permits the mounting of the valve chest in the cylinder head, and forming a continuous bearing surface for the sealing ring during the said mounting.

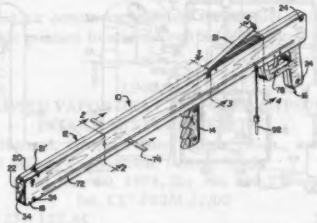
3,963,017
MANUALLY COCKING SPRING-POWERED PROJECTILE LAUNCHER

James M. Pfotenhauer, 1302 N. 19th St., Escanaba, Mich. 49829

Filed Jan. 6, 1975, Ser. No. 538,801

Int. Cl.² F41B 7/00

U.S. Cl. 124—21 **5 Claims**



1. A projectile launcher comprising:

a housing means for forming a barrel and at least one hand grip;

said housing means including a pair of longitudinal sections secured together by releasable fasteners;

each of said sections being recessed so as to define an inner bore when said sections are secured together;

said bore including a compartment, a projectile launching channel, and a slot portion communicating said launching channel with said compartment;

an elongate cocking bar;

an impact plunger having a projectile discharge portion slidably disposed in said channel and having forward and rearward ends;

said discharge portion including a trigger engaging portion at the bottom thereof;

said plunger including a cocking aperture located in a rear portion thereof and being aligned with slots in said housing sections to removably receive said cocking bar completely through said aperture and slots so as to be grippable by both hands of an operator;

said cocking bar, when drawn rearwardly, being operable to shift said plunger rearwardly toward a cocked position;

said plunger including a web portion extending upwardly from said discharge portion and being slidable in said slot portion of said bore, said discharge portion being of greater thickness than said slot portion to retain said discharge portion in said channel;

an elongate, flexible spring element disposed in said compartment;

one end of said spring element being anchored at a point near the front end of said housing;

the other end of said spring element being operably connected to said web portion so that rearward movement of said plunger toward a cocked position tensions said spring;

trigger means at the rear of said housing for engaging said trigger engaging portion and latching said plunger and said spring element in a cocked condition;

said trigger means being operable to unlatch said plunger to allow said spring element to propel said plunger forwardly; and

a freely rotatable pulley located in said compartment above said launching channel and intermediate the ends of said spring when said spring is tensioned;

said spring passing around and being in contact with said pulley when in a tensioned condition so as to be guided thereby;

said front anchoring point of said spring being disposed above the point of operable connection between said spring and said web portion so that said spring, in a tensioned condition, is inclined so as to apply an upwardly and forwardly directed force to said plunger;

said point of operable connection between said spring and said web portion being spaced from said front and rear ends of said plunger.

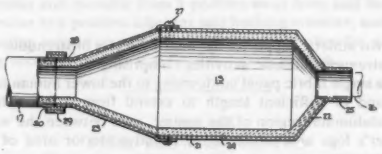
3,963,018
COMBUSTION FURNACE AND INFRA-RED RADIANT HEATING SYSTEM

Russell H. Schultz, West Islip, N.Y., assignor to Natural Resource Systems, Inc., West Islip, N.Y.

Continuation-in-part of Ser. No. 458,350, April 5, 1974, abandoned, which is a division of Ser. No. 350,265, April 11, 1973, abandoned. This application June 12, 1975, Ser. No. 586,171

Int. Cl.² F24C 3/06

U.S. Cl. 126—91 A 12 Claims



1. An improved radiant heating system comprising in combination a fluid-fired burner, a combustion chamber and, extending from said chamber, a tubular conduit for receiving the products of combustion from said burner and radiating infrared energy to the surroundings, wherein the improvement comprises a combustion chamber comprising a sheet metal shell and sheet metal end members, said shell being provided with an imperforate lining of a refractory material, whose internal surface is tapered at each end thereof, whereby the tapered surface at one end of said chamber has a high degree of taper to an axially positioned collar for receiving the air tube of a fluid-fired burner, and mounted in said collar, an axially positioned air tube of said fluid-fired burner having means for forcing air through the burner and combustion chamber, and the tapered surface at the other end of said chamber has a low degree of taper to a narrow outlet end, said outlet end having means to mount said tubular heating circuit extending away from said combustion chamber, the tapers of said one and other ends being such that pulsation is essentially eliminated and back pressure in the chamber is minimized.

3,963,019
OCULAR TESTING METHOD AND APPARATUS

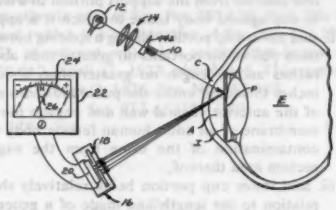
Robert S. Quandt, 8 Darby Lane, Deerfield, Ill. 60015

Filed Nov. 25, 1974, Ser. No. 526,851

Int. Cl.² A61B 5/00

U.S. Cl. 128—2 T 11 Claims

1. Apparatus for detecting changes or variations in a patient's body chemistry comprising means for projecting a beam of plane polarized light through the aqueous humor of a patient's eye, the aqueous humor containing a chemical which rotates the polarization axis of the light beam as it passes therethrough in proportion to the amount of said chemical present in the aqueous humor, and an analyzer positioned to be impinged by said exiting beam of light, said analyzer



including means for measuring the angle through which the polarization axis of the light beam has been rotated.

3,963,020
URINAL FOR HUMAN FEMALES

Kenneth F. Hall, 9205 W. 73rd Place, Arvada, Colo. 80005

Continuation of Ser. No. 418,357, Nov. 23, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 547,787

Int. Cl.² A61B 10/00; E03D 13/00; A61G 9/00

U.S. Cl. 128—2 F 5 Claims

1. In a disposable urinal and urine specimen collector for adult human females, the combination comprising:

A. a receptacle for containing urine; and

B. a head section in flow communication with the receptacle, said head section having

a. a tubular support portion having a laterally spaced first pair of lip portions, and

b. a generally leaf-shaped upper cup portion supported at one end by the support portion and projecting away from the support portion,

i. said upper cup portion being concavely curved along the inside surface forming a laterally spaced second pair of lip portions that are upper extensions of said first pair of lip portions and are separated from one another to a maximum extent where they merge with said first pair of lip portions, said second pair of lip portions converge inwardly toward one another from the support portion to a leading tip to cup against body tissue to which it is applied,

ii. said upper cup portion having spacing between said second pair of lip portions no greater than about 1.25 inches and a length no greater than about 1.5 inches to lie entirely within the area between the labia and terminate below the clitoris of an adult human female body,

iii. said upper cup portion being relatively shallow in relation to the length thereof and made of a generally soft pliable plastic material to afford a slight degree of flexture in relation to said support portion,

c. a generally leaf-shaped lower cup portion supported at one end by the support portion and projecting away from the support portion,

i. said lower cup portion being laterally concavely curved along the inside surface forming a laterally spaced third pair of lip portions that are lower exten-

sions of said first pair of lip portions and are separated from one another to a maximum extent where they merge with said first pair of lip portions, said third pair of lip portions converge inwardly toward one another from the support portion to a leading tip to cup against body tissue to which it is applied,

ii. said lower cup portion having a spacing between said third pair of lip portions no greater than about 1.25 inches and a length no greater than about 1.125 inches to extend under the pubic arch into a portion of the anterior vaginal wall and engage the mucous membrane of an adult human female body to block contamination of the urine from the vagina and rectum area thereof,

iii. said lower cup portion being relatively shallow in relation to the length and made of a generally soft pliable plastic material to afford a slight degree of flexure in relation to said support portion,

d. the second and third pairs of lip portions diverging away from the support portion at an angle to one another of about 80 degrees to closely conform to the angle of the pubic arch of the adult human female body,

e. said first, second and third pairs of lip portions forming an endless body-engaging lip on the head section that seals against the body tissue to which it is applied throughout the entire perimeter thereof to avoid urine leakage during the use thereof.

3,963,021

RESPIRATORS

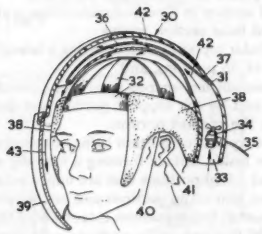
Barrie Bancroft, Dronfield, near Sheffield, England, assignor to Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed July 9, 1974, Ser. No. 486,856

Claims priority, application United Kingdom, Jan. 16, 1974, 2095/74

Int. Cl.² A61F *9/06*

U.S. Cl. 128—145 R **6 Claims**



1. A respirator comprising:

a helmet having a top, front, side and rear portions and including only two domed structural layers located one within the other, one of said layers being an apertured support harness for engagement on the head of a wearer, said other layer being an impermeable outer hood structure, and said two layers being sealingly connected to each other along said side portions of said helmet but otherwise located in spaced relation defining therebetween a single open-ended domed passageway extending between the front portion and rear portion of said helmet;

a bag-form filter having a void-forming body predominantly defined by two opposed similarly domed sides, and having a mouth at an edge portion of said sides affording access to said void, said filter extending in said passageway from said rear portion to said front portion and being sealingly connected around its mouth at a location adjacent said rear portion between said helmet layers to laterally fill a rear portion of said passageway with said mouth opening towards the rear portion of said helmet and with said body extending through said passageway in generally conforming disposition therewith towards the front portion of said helmet;

and powered air displacement means connected with the rear portion of said helmet and communicating with said passageway to pass air forcibly through said passageway, by way of said filter, from the rear portion to the front portion of said helmet.

3,963,022

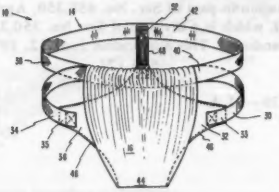
COMFORT ATHLETIC SUPPORTER

Joseph Vincent Rotello, 6052 Welch St., Arvada, Colo. 80004

Filed Sept. 5, 1975, Ser. No. 610,543

Int. Cl.² A61F *5/40*

U.S. Cl. 128—158 **10 Claims**



1. An athletic supporter for wear by males in strenuous and non-strenuous athletic activities comprising:

a. a single fabric panel conforming to the lower human torso and of sufficient length to extend from a lower front abdominal region of the wearer, pass between the wearer's legs and terminate at a mid-posterior area of the wearer;

b. the single fabric panel being shaped with sufficient width at a first end of the fabric piece to substantially cover the lower front abdominal region of the wearer, with sufficient narrowing at a central portion of the fabric panel to fit between the wearer's legs with comfort, and with a fan shaped configuration at a second end of the fabric panel terminating at the mid-posterior area of the wearer; and

c. a single piece elastic waistband having a first end and a second end, the first end being attached to a first side of the fan shaped configuration of the fabric panel and the second end being attached to a second side of the fan shaped configuration of the fabric panel, and a central portion completely encircling the torso of the wearer in the area of the wearer's waist with a single layer of waistband in the area of the wearer's back and a double layer of waistband in the area of the wearer's abdomen, said first end of said fabric panel being loosely secured to said double layer of waistband over the abdomen.

3,963,023

EXTRACORPOREAL BLOOD CIRCULATION SYSTEM AND PUMP

George R. Hankinson, Littleton, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

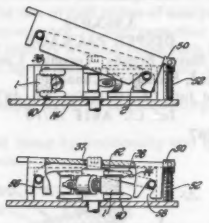
Filed Nov. 4, 1974, Ser. No. 520,198

Int. Cl.² A01M *1/02*; **F04B** *43/08*, *43/12*, *45/06*

U.S. Cl. 128—214 F **14 Claims**

1. An extracorporeal blood circulation system for circulating a patient's blood from and then back to the patient through tubing at least a portion of which is flexible, said system including a pump to cause the blood to circulate through the system, said pump comprising a backing member at least a portion of which is of arcuate shape receiving thereagainst said flexible portion of said tubing when said pump is operable, a rotor having rotatably secured thereto a plurality of rollers for contact with the flexible tubing portion to oc-

clude said tubing portion in the areas of contact of each roller therewith thereby to pump blood through the tubing in the direction of rotation of the rotor, a tube positioning member for positioning said flexible tubing portion adjacent said backing member, and means connected to said rotor to move the flexible tubing portion from its position adjacent said backing



member to a position between said rollers and said backing member upon actuation of said rotor, said tube positioning member comprising a member connected to said backing member and movable from a position away from said backing member to a position adjacent said backing member, and tube securing means on said tube positioning member for removably securing thereto said flexible tubing portion.

3,963,024

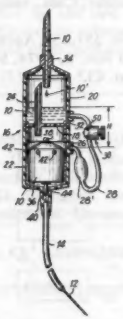
FLUID FLOW REGULATOR

Michael Goldowsky, 222 Martling Ave., Tarrytown, N.Y. 10591

Filed Apr. 8, 1975, Ser. No. 566,076

Int. Cl.² A61M *5/16*

U.S. Cl. 128—214 R **9 Claims**



9. An administration set for the infusion of a supply liquid in a supply container into a separate liquid system comprising a flow tube and a flow restrictor including a frame defining a substantially semi-circular passage for said flow tube and a movable conical wedge for pressing said flow tube against said frame to restrict flow therethrough by squeezing a sufficiently long length of said flow tube to establish laminar flow.

3,963,025

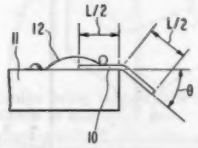
OCULAR DRUG DELIVERY DEVICE

Gordon W. Whitaker, Palo Alto, and Yigal Gad, Mountain View, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 505,629, Sept. 16, 1974, abandoned, which is a continuation of Ser. No. 423,203, Dec. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 350,062, April 11, 1973, abandoned. This application June 2, 1975, Ser. No. 582,948

Int. Cl.² A61M *31/00*

U.S. Cl. 128—260 **8 Claims**



1. In a sustained release ocular drug delivery device comprising a flexible body that is formed of a bioerodible polymeric material, sized and shaped for insertion in either cul-de-sac of the eye, and contains a drug, the improvement wherein the body has a stiffness and resistivity to bending manifested by a centroidal unsupported bending angle of less than 40° during its drug dispensing lifetime.

3,963,026

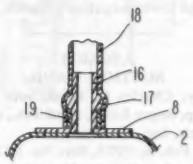
BLOOD COMPONENT STORAGE BAG AND GLYCEROLIZING SET THEREFOR

John R. Herb, Easton, Pa., assignor to Pharmachem Corporation, Bethlehem, Pa.

Filed Nov. 19, 1974, Ser. No. 525,212

Int. Cl.² A61J *1/00*; A61M *5/00*

U.S. Cl. 128—272 **4 Claims**



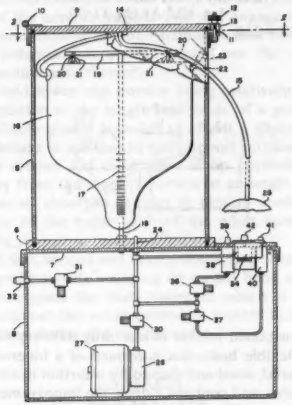
1. The combination of a bag for storing blood components with a tube member communicating therewith, said combination comprising, a sterilizable, flexible closed container including an inlet therein forming part of said closed container, said inlet being adapted for fluid-tight connection to said tube member through which said blood components are caused to flow, said tube member having an end portion composed of a plastic material which is incompatible for solvent-welding with the material of said inlet, said inlet consisting of a base and a hollow protrusion having on its outer surface an enlarged portion spaced from said base, a sleeve trapped between said enlarged portion and said base, said sleeve being composed of a plastic material which is compatible for solvent-welding with a portion of said tube member, said tube member including a portion compression fitted over said enlarged portion and solvent-welded to said sleeve.

3,963,027

MEDICAL/SURGICAL SUCTION EQUIPMENT

Edward E. Muriot, Horsham, Pa., assignor to Health Technology Labs, Inc., Horsham, Pa.

Continuation-in-part of Ser. No. 497,838, Aug. 16, 1974, abandoned. This application Nov. 15, 1974, Ser. No. 524,052
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 12 Claims



1. Equipment for withdrawing body liquids comprising a vacuum chamber, a suction bag adapted to be removably positioned in the vacuum chamber and having an opening for interconnecting the interior of the bag with the interior of the chamber, the bag further having an inlet connection comprising an inlet tube with the tube wall connected with the wall of the bag and extended therefrom to a point exterior of the vacuum chamber for intake of body liquid, a vacuum line adapted to be connected with a pressure reduction source of substantially constant reduced pressure, said line being connected with the vacuum chamber independently of the bag and being in communication with the interior of the vacuum chamber externally of the bag, and mechanism providing for timed intermittent fluctuation of the suction in said chamber between upper and lower negative pressure limits.

3,963,028

SUCTION WAND

Denton A. Cooley; Charles C. Reed, both of Houston, and Russell G. Sharp, Sugar Land, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Feb. 6, 1975, Ser. No. 547,529
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 2 Claims

1. A surgical suction wand comprising:

a weighted handle of metal construction, the handle comprising a single axial, generally cylindrical through-bore opening at the leading end and at the trailing end of the handle, the leading end of the through-bore tapering outwardly;

an elongated suction conduit comprising a unitary, generally cylindrical insert having an external configuration which corresponds to the through-bore within the handle, the insert tapering outwardly at its leading end;

the external surface of the insert defining a diameter which is essentially the same as the diameter of the through-bore, said insert being telescopically surmounted by the handle and releasably attached thereto with a press-fit coupling, the through-bore receiving the insert in snug relationship along the entire length of the bore; and

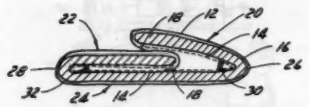
a coupling for flexible suction tubing integral and coextensive with the trailing end of the insert, said coupling projecting beyond the trailing end of the handle when the handle surmounts the insert.

3,963,029

DIAPER PACKAGE

William Victor Hayes Brooks, Toronto, Canada, assignor to Domtar Limited, Montreal, Canada

Filed July 12, 1974, Ser. No. 487,863
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 6 Claims



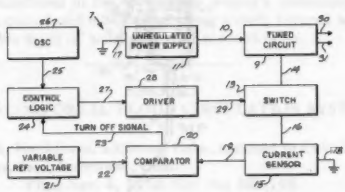
1. A disposable diaper comprising a plastic backing sheet, a porous facing sheet, an absorbent pad interposed between said backing and facing sheets, said backing sheet extending beyond said pad to form a flap on each side of said pad, said flap being folded around the side edge of said pad into overlying relationship with said pad, means for sealing longitudinal end edges of said pad, a pair of longitudinally extending folds dividing said diaper into a central section and a pair of lateral wing sections, one of said pair of lateral wing sections being folded into overlying relationship with said central section with a portion of said facing sheet on said wing section in face-to-face relationship with a portion of said facing sheet on said central section, the other of said pair of lateral wing sections being folded over said one wing section thereby to completely enclose the facing sheet.

3,963,030

SIGNAL GENERATING DEVICE AND METHOD FOR PRODUCING COAGULATION ELECTROSURGICAL CURRENT

David W. Newton, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Continuation of Ser. No. 351,232, April 16, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,219
Int. Cl.² A61B 17/36
U.S. Cl. 128—303.17 3 Claims



1. An electrosurgical method for coagulating tissue comprising the steps of

generating a D.C. voltage;

generating a pulse train having a predetermined pulse repetition frequency;

repetitively connecting said D.C. voltage across a tank circuit comprising at least a capacitor and a primary winding of a transformer, said capacitor and primary winding being in parallel connection and the resonant frequency of said tank circuit being substantially greater

than said predetermined pulse repetition frequency, in response to each occurrence of a pulse of said pulse train to thereby store electrical energy in said tank circuit during each occurrence of said pulses;

repetitively disconnecting said D.C. voltage from said tank circuit in response to each termination of a pulse of said pulse train so that the said electrical energy stored in said tank circuit is coupled through a secondary winding of said transformer as a burst of pulses of decaying amplitude each time one of said pulses of said pulse train terminates, the capacitance of said capacitor and the inductance of said primary winding being such that crest factor of the output signal from said secondary winding is about 5 to 10;

applying said output signal to an electrosurgical instrument; and

coagulating said tissue by positioning said instrument adjacent said tissue.

3,963,031

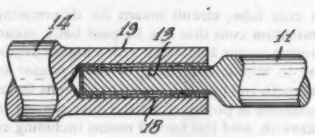
JUNCTURE-LUBRICATED NEEDLE-SUTURE COMBINATION

Alastair W. Hunter, Somerville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Dec. 11, 1974, Ser. No. 531,561

Int. Cl.² A61B *17/06*

U.S. Cl. 128—339 **9 Claims**



1. In a needle-suture combination having a suture pull out value of from about 3–26 ounces comprising a needle having a sharp end and a blunt end, means forming a recess at the blunt end of said needle and a suture having a tip at one end positioned within said recess, said blunt end being swaged to bring at least a portion of the inner surfaces of said recess into tight engagement with said suture tip to attach said suture to said needle, the improvement comprising having a lubricant layer between said suture tip and said inner surface of said recess in an amount effective to substantially reduce the suture pull-out value relative to the pull-out value in the absence of said lubricant layer.

3,963,032

THRESHING MACHINE

Ernst Rüede, Bietingen, Germany, assignor to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Apr. 21, 1975, Ser. No. 569,710

Claims priority, application Germany, Apr. 22, 1974, 2419268

Int. Cl.² A01F *12/00*

U.S. Cl. 130—27 E **9 Claims**

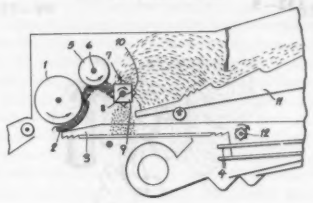
1. In a harvesting-type threshing machine in combination:

a support structure;

a threshing drum rotatable on said support structure about a horizontal axis in one sense for receiving crop material and dislodging grain from a chaff containing straw of the crop material and feeding the mixture of straw and grain in a stream;

a straw-deflecting drum rotated on said structure rearwardly of said threshing drum and above the axis thereof about a further horizontal axis in said sense, said straw-deflecting drum being disposed in the path of said stream for deflecting said stream in rearward direction relative to the direction of displacement of the machine;

a multiple-disk roller rotated about a respective horizontal axis and disposed rearwardly of said straw-deflecting drum below the axis thereof for intercepting the stream of material deflected thereby for separating straw from



grain, said roller being rotated in a sense opposite the sense of rotation of said drum; and

a straw shaker rearwardly of said roller and receiving straw cast thereon by said roller.

3,963,033

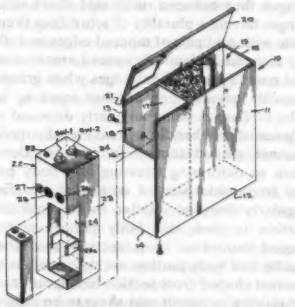
ELECTRONIC SMOKING INHIBITING DEVICE

John W. Pope, P.O. Box 45246, Dallas, Tex. 75235

Filed May 28, 1975, Ser. No. 581,633

Int. Cl.² A24F *15/06*

U.S. Cl. 131—170 A **8 Claims**



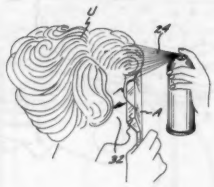
1. Apparatus for inhibiting cigarette smoking, comprising a cigarette case having a cigarette storage compartment, a movable lid normally closing said compartment and movable to an open position permitting access to the compartment for removal of a cigarette, smoking inhibiting means carried by the case administering faradic shock punishment to a user person operating the case under predetermined conditions comprising an electronic circuit housed in said cigarette case including an electrical faradic shock generator for producing a faradic shock electrical signal and an electrical delay means activated upon opening of the lid to establish a predetermined post-opening delay period following opening of said lid and activate said faradic shock generator to produce said faradic shock electrical signal at the end of said delay period, and an electrically conductive shock applying device to be conductively connected to said shock generator and to be supported in contact with the skin of the user for applying the faradic shock signal to the user to produce the shock punishment.

3,963,034

MAKE UP GUARD

Richard K. Runberg, and Shirley M. Runberg, both of 391 Ironpike Circle, Anaheim, Calif. 92807

Filed Jan. 31, 1975, Ser. No. 546,007
Int. Cl.² A45D *4/18*
U.S. Cl. 132—9 2 Claims



1. A make up guard for protecting the face of a user from hair spray, said guard when not in use being capable of selectively occupying either a flat configuration or coiled configuration in which it may be wound about a container holding an aerosol type hair spray without obscuring the label on said container, said guard including:

a generally paddle shaped sheet of a resilient polymerized transparent resin that includes a rectangular body portion from which an elongate rectangular handle of narrower width projects, said body portion and handle having laterally spaced pairs of first and second longitudinal edges, said first and second pairs of edges at their adjacents ends being connected by oppositely tapered edges, and first and second pairs of core lines formed in said sheet inwardly from said first and second edges and cooperating therewith to define first and second pairs of elongate flanges therebetween, with said sheet intermediate said flanges having a plurality of score lines therein that cooperate with said pair of tapered edges to define two generally trapezoidal laterally spaced areas on said sheet, and said pair of longitudinal edges when grasped and forced inwardly towards one another resulting in said second pairs of flanges being angularly disposed relative to the balance of said handle and said handle having a generally channel shaped transverse cross section, said handle when so deforming stressing said body portion through said trapezoidal shaped areas that said first flanges are angularly disposed relative to the balance of said body portion to have said body portion assume a channel shaped transverse cross section, said sheet when said handle and body portion are deformed to said transverse channel shaped cross section having substantial longitudinal rigidity to permit said sheet to be adjacently disposed to the face of a user to act as a make up guard when hair spray is being discharged onto the hair of said user and said resilient polymerized resin defining said sheet having a sufficiently good memory that said sheet returns to a substantially flat configuration when exertion of said force on said longitudinal edges is terminated.

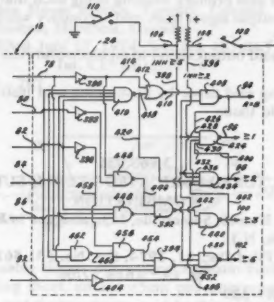
3,963,035

COIN CONTROLLED CIRCUITS FOR VENDING AND OTHER COIN CONTROLLED DEVICES

Joseph L. Levasseur, St. Louis, Mo., assignor to H. R. Electronics Company, High Ridge, Mo.

Continuation-in-part of Ser. No. 381,900, July 23, 1973, Pat. No. 3,841,456. This application Oct. 7, 1974, Ser. No. 512,850
Int. Cl.² G07D *1/06*
U.S. Cl. 133—2 6 Claims

1. In a coin controlled device having means to accumulate amounts deposited and means to pay back amounts deposited in excess of a vend price including a plurality of coin tubes for respectively accumulating different denomination coins, each of said coin tubes having coin sensing means associated therewith to produce a response whenever the quantity of coins therein has fallen below a predetermined quantity, coin tube actuator means associated with each coin tube and means for energizing the respective coin tube actuator means to pay back coins therefrom, the improvement comprising gate circuit means associated with each coin tube, each of said gate circuit means having an output connected to energize the associated actuator means, means connecting the output of the gate circuit associated with a higher denomination coin tube to an input to gate circuit means associated with a lower



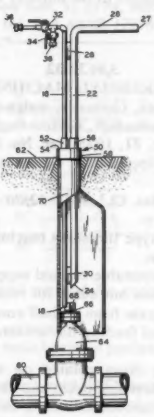
denomination coin tube, circuit means for determining the highest denomination coin that can be paid back, means including the sensing means associated with a higher denomination coin tube to inhibit energizing of the actuator means associated therewith and prevent paying back coins therefrom whenever a response is produced by the coin sensing means associated therewith, said last named means including circuit means to establish a circuit to enable energizing of the actuator means associated with a lower denomination coin tube that contains more than the predetermined quantity of coins therein to make further paybacks therefrom.

3,963,036

SHUT-OFF VALVE EXCAVATOR

Carl Irelan, Jr., 117 E. 36th St., Boise, Idaho 83704

Filed Mar. 7, 1975, Ser. No. 556,242
Int. Cl.² B08B *3/02*
U.S. Cl. 134—102 1 Claim



1. Apparatus for cleaning out and flushing away debris from

around a shut-off valve located in a closed sleeve to facilitate access to the valve, said apparatus comprising:

an inflow pipe for carrying flushing fluid into the closed sleeve;

an outflow pipe generally parallel to said inflow pipe and secured to said inflow pipe by a pair of spaced apart spacer blocks, said outflow pipe carrying flushing fluid and entrained debris out of the closed sleeve;

means for controllably supplying flushing fluid to said inflow pipe; and

a collar slidably carried on said inflow and outflow pipes between said spacer blocks, said slidable collar being of greater diameter than the sleeve whereby said collar is slidable over an open end of said sleeve to allow outflow of flushing fluid.

3,963,037

DEMOUNTABLE STICK

George Reginald Seymour Clark, Christchurch, New Zealand, assignor to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Aug. 21, 1974, Ser. No. 499,239

Claims priority, application New Zealand, Aug. 30, 1973, 171844; Jan. 28, 1974, 173204

Int. Cl.² A45B 9/00

U.S. Cl. 135—45 R 1 Claim

1. A stick comprising in combination:

a plurality of hollow shafts including a first and second shaft joined together by joints wherein a first end of a first shaft carries near its tip an O-ring held in a groove and carries at a predetermined fixed distance from the O-ring an inwardly tapering male conical surface coaxial with and surrounding said first end, and a first end of a second shaft carries within said end a female conical surface coaxial with said second shaft, said second shaft being matingly engaged at its complementary female outwardly tapered conical surface by said male conical surface on said first shaft, and a second end of said second shaft carries within it a constriction located at a distance from the female conical surface equal to the distance between said O-ring and male conical surface on said first shaft, said constriction being engaged with said O-ring;

a captive elastic cord within said plurality of hollow shafts; and

means at one end of said plurality of hollow shafts anchoring said elastic cord and means at the other end of said plurality of hollow shafts connected in a tension-resisting manner to said elastic cord whereby tension may be applied to the cord to define an interlocking, demountable stick.

3,963,038

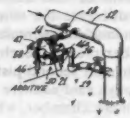
LIQUID PROPORTIONING PUMP

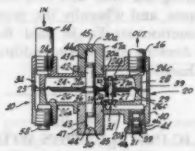
Raymond W. Jensen, 28081 Ella Rd., Palos Verdes Peninsula, Calif. 90274

Filed Aug. 15, 1974, Ser. No. 497,818

Int. Cl.² G05D 11/03

U.S. Cl. 137—99 12 Claims





1. A hydraulically actuated volumetric proportioning pump, for injecting one liquid into another liquid, comprising:

a main housing;

a diaphragm movably mounted within said main housing and generally centrally located therewithin to form a first main chamber and a second main chamber;

fluid inlet means to each of said first and second main chambers, said fluid inlet means being adapted to be connected to a main fluid source;

first and second outlet ports for said first and second main chambers, respectively;

a main valve means mounted to said diaphragm and movable therewith to alternatively open and close the first and second outlet ports of said first and second main chambers in response to the movement of said diaphragm;

piston housing means mounted to the main housing having bores therein defining a first and second piston chamber means;

a piston means mounted to the diaphragm and movable within said first and second piston chamber means as a result of the movement of said diaphragm;

an additive inlet means, adapted to be connected to a source of additive fluid, communicating with at least one of said piston chamber means;

an additive outlet means, leading from at least one of said piston chambers to at least one of said main chambers;

an additive inlet valve means for said additive inlet means;

an additive outlet valve means for said additive outlet means, whereby as fluid moves into said main chambers from said main fluid source, said diaphragm is moved, under the influence of a pressure differential imposed between said first and second main chambers, towards one side of said main housing, and

said main valve means, mounted to said diaphragm, thereby moves to close said first outlet port and open said second outlet port,

said piston means, mounted to said diaphragm, moves to decrease the volume of the first piston chamber means and increase the volume of said second piston chamber means thereby creating a suction stroke in said second piston chamber means, drawing additive fluid, through said additive valve inlet means and into said second piston chamber means and also creating a delivery stroke, in said first piston chamber means, to eject any additive stored in said first piston chamber through said additive valve outlet means, and into said first main chamber, which additive is evacuated from said first

main chamber with the main fluid during the time that said first outlet port is open,

and, as said first outlet port is closed, said outlet port of said second main chamber is opened, thereby imposing a reverse pressure differential which causes said diaphragm to move in a direction which is the reverse of its previous direction, whereby the main valve means moves to close off said second outlet port,

the reverse movement of said diaphragm causing said piston means to decrease the volume of said second piston chamber means and increase the volume of said first piston chamber means thereby causing any additive fluid stored in said second piston chamber means to be ejected through said additive valve outlet means, into said second main chamber, which additive is then evacuated through said second outlet port with main fluid, during the time that said second outlet port remains open, and whereby the reverse movement creates a suction stroke in said first piston chamber thereby drawing and storing additive fluid in said first piston chamber.

3,963,039
HYDRAULIC INSTALLATION WITH MEANS FOR STORING ENERGY

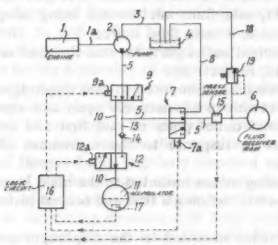
Yves G. Coeurderoy, Lagney-Le-Sec, France, assignor to Societe Anonyme: Poclain, Belleville, France

Filed Jan. 14, 1975, Ser. No. 540,966

Claims priority, application France, Jan. 24, 1974, 74.02411

Int. Cl.² F15B *15/00*

U.S. Cl. 137—118 **4 Claims**



1. A hydraulic installation comprising: at least one pump means for delivering a fluid under pressure through a delivery pipe; a first selectively operable regulator means operatively connected to said delivery pipe for selectively supplying fluid under pressure to a receiver member or a fluid tank; second regulator means operatively connected to said delivery pipe, between said pump means and said first regulator means for establishing, in a first position, communication between the pump means and a first set of auxiliary pipework, including an accumulator of fluid under pressure while preventing fluid flow in said delivery pipe beyond the second regulator means, and in a second position, communication between the said delivery pipe and said first regulator means while preventing fluid flow from the delivery pipe to said first set of auxiliary pipework; said first set of auxiliary pipework including third regulator means for establishing, in a first position, communication between the accumulator and a second set of auxiliary pipework, connected to the delivery pipe between the first and second regulator means while preventing fluid flow from said delivery pipe to said first set of auxiliary pipework and, in a second position, communication between said delivery pipe and said first set of pipework while preventing fluid flow from the accumulator to the second set of auxiliary pipework; pick-up means for emitting a signal indicative of the position of the first regulator means; a pressure-pick-up means for emitting a signal indicative of the pressure in the accumulator; and logic means responsive to said signal indicative of the position of the first regulator and to said signal indicative of the pressure in the accumulator, for controlling the positions of the second and third regulators.

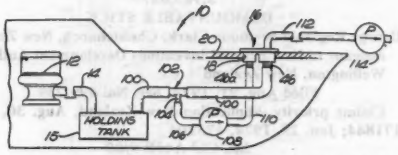
3,963,040
WASTE DISPOSAL SYSTEM

Walter A. Gezari, Killingworth, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 315,410, Dec. 15, 1972, Pat. No. 3,870,084. This application Nov. 25, 1974, Ser. No. 526,965

Int. Cl.² B60N *3/00*

U.S. Cl. 137—344 **7 Claims**



1. A waste disposal system for a boat having a deck and a waste holding tank therebelow comprising:

a dual deck fitting adapted to be mounted in an aperture in the boat deck;

said fitting being formed with first and second pairs of inlet and outlet ports;

pump means for mounting in said boat;

a first conduit having one end connected to the inlet port of said first pair and the other end adapted to be connected to said holding tank;

a second conduit having one end connected to the inlet port of said second pair and the other end connected to the outlet of said pump means; and

a third conduit having one end for flow communication with said tank and the other end connected to the inlet of said pump means.

3,963,041
SAFETY SHUTOFF VALVE

Hugh D. McGillis, Brockton, Mass., assignor to McGillis Engineering, Inc., Brockton, Mass.

Continuation-in-part of Ser. No. 446,530, Feb. 27, 1974, abandoned. This application May 1, 1975, Ser. No. 573,741

Int. Cl.² F16K *31/18*

U.S. Cl. 137—410 **4 Claims**

1. A safety shutoff valve of the type having a housing with an inlet and an outlet, a baffle inside the housing partially closing the passageway between said inlet and outlet, a valve member inside the housing swingable from an open position wherein it underlies the baffle and a closed position wherein it closes the passage between said inlet and outlet, the improvement comprising

A. means for biasing the valve member toward its open position,

B. an opening through the baffle,

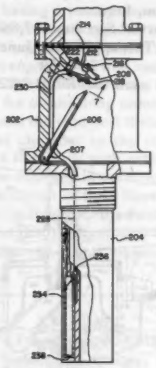
C. a door mounted in the housing and movable between a closed position wherein it closes the opening through the baffle and an open position wherein it permits liquid to flow through the opening,

D. means for biasing the door to its closed position,

E. a movable member mounted on the housing and movable between first and second positions in response to the level of liquid relative to the housing, and

F. means linking the door and the movable member so that when the movable member is in its first position, the door

is closed and when the movable member is in its second position, the door is open so that incoming liquid flows



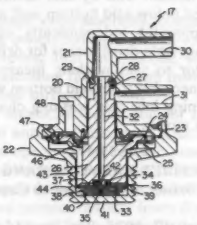
through said opening and engages behind the valve member, driving it to its closed position.

3,963,042

INTERNAL COMBUSTION ENGINE CONTROL SYSTEM AND IMPROVED PNEUMATICALLY OPERATED TEMPERATURE CONTROLLED VALVE CONSTRUCTION THEREFOR OR THE LIKE

Harley V. Bible, Maryville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 21, 1974, Ser. No. 499,176
Int. Cl.² F02P *5/04*
U.S. Cl. 137—468 **10 Claims**



1. A pneumatically operated temperature controlled valve construction adapted for initially interconnecting a pneumatic source to a pneumatically operated device only when said construction senses a certain temperature, said construction having means for thereafter only disconnecting said source from said device when the value of said source falls below a certain level thereof regardless of sensed temperature, said construction having temperature operated pilot valve means adapted for actuating the same to an open condition thereof when said certain temperature is sensed.

3,963,043

PRESSURE SENSING METHOD AND APPARATUS FOR GASES

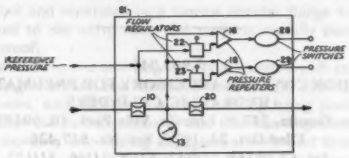
Mario E. Cota, Scottsdale, and Jerry A. Taylor, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Jan. 2, 1975, Ser. No. 538,231
Int. Cl.² F16K *37/00*
U.S. Cl. 137—487.5 **4 Claims**

1. Apparatus for sensing the rate of flow of a gas through a conduit, said apparatus having individual summing junctions for high and low flow limits, each summing junction having a reference flow source, said apparatus comprising:

at least two orifices installed in series within a conduit, normal to the flow of gas, so as to provide a pressure reservoir therebetween; and a pressure tap mounted in the wall of the conduit to supply a sample of the flowing gas, whose pressure is to be sensed.

at least two pressure repeaters respectively providing separate and individual summing junctions for preset high and low pressure limits whereby these preset high and low pressure limits describe a band of acceptable gas flow



rates and these preset high and low pressure limits are some function of respective high and low gas flow rates each including a flexible membrane one side of which is connected to the pressure tap;

a separate and independent reference gas pressure source supplying calibrated static pressure to the other side of each of the flexible membranes mounted within the pressure repeaters; and

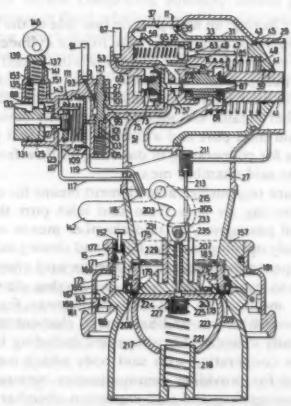
at least two pressure switches each operating from a separate and individual pressure repeater indicating the binary state of the monitored gas static pressure.

3,963,044

PILOT VALVE OPERATED PRESSURE REGULATOR

Albert W. Brown, Newport Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 344,858, March 26, 1973, abandoned, and a continuation-in-part of Ser. No. 291,894, Sept. 25, 1972, abandoned. This application July 3, 1975, Ser. No. 593,007
Int. Cl.² F16K *31/363*
U.S. Cl. 137—490 **7 Claims**



1. A portable pressure control valve for use in conjunction with a stationary hydrant for automatically precisely regulating the downstream pressure of a fluid flowing from said hydrant at a predetermined pressure level, comprising:

a main valve housing, including a main flow passage;

a main piston, adjustably positioned within said main flow passage to precisely regulate the flow of fluid therethrough;

a control passage for maintaining fluid under pressure for adjusting the position of said main piston; and a pilot valve, responsive to said downstrem pressure of said fluid for automatically regulating the pressure of the fluid in said control passage to precisely regulate said downstream pressure at said predetermined pressure level, said pilot valve located within said main valve housing to protect said pilot valve from damage.

3,963,045

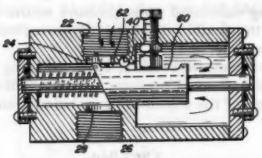
CUSHION CONTROL ACCESSORY FOR PNEUMATIC OR HYDRAULIC CYLINDERS

Vernon Damitz, 347 N. Lincoln, Villa Park, Ill. 60181

Filed Oct. 24, 1974, Ser. No. 517,426

Int. Cl.² F15B *13/042;* **F16K** *31/36, 31/122*

U.S. Cl. 137—505.13 **7 Claims**



1. A cushion control apparatus, for use with a pneumatic cylinder assembly which has a cylinder and a piston, for cushioning the piston as said piston reaches the end of its stroke and for preventing damage to the cylinder assembly, which comprises:

a. a body having: an inlet port on one side of the body which is adapted to receive air flow from a cylinder; an outlet port; expansion chamber means within said body; first branched passageway means within said body interconnecting said inlet port, outlet port and said expansion chamber means; and second passageway means connecting said inlet port and a branch of said first passageway means for cooperating in directing air flow from said inlet port to said chamber means;

b. pressure responsive valve element means for cooperation in directing air flow from said inlet port through said second passageway to said chamber means and for controllably opening said inlet port and closing said inlet port in response to increased pressure in said chamber means so as to cushion said piston, said valve element means being mounted in said first passageway for reciprocal movement therein and said valve element means being generally cylindrical in shape and including land portion means cooperating with said body which means are arranged for providing communication between said second passageway and said expansion chamber means;

c. valve means associated with said chamber means for venting said chamber means to atmosphere so as to controllably release said cushion; and

d. control valve means are provided in association with said second passageway for cooperating in controlling the flow of air from said inlet port to said expansion chamber means.

3,963,046

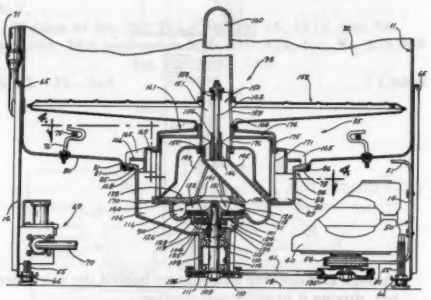
DISHWASHER

Richard P. Bergeson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Continuation-in-part of Ser. No. 467,868, May 8, 1974, Pat. No. 3,906,967. This application June 5, 1975, Ser. No. 584,050

Int. Cl.² B08B *3/02*

U.S. Cl. 137—565 **13 Claims**



1. In a dishwasher apparatus, the combination comprising: means defining a washing chamber and including a bottom wall defining a generally central opening; washing means disposed at least partially in said opening and including a housing defining at least one pump cavity and further including rotatable means for effecting a washing of articles in said chamber and a draining of washing fluid therefrom; connector means accessible from said washing chamber for connecting said washing means to said bottom wall, said washing means being constructed for assembly into the opening in said bottom wall from within said washing chamber and removably connected to said bottom wall by said connector means; a drive motor disposed below said bottom wall and mounted to said dishwasher apparatus independently of said washing means; and disconnectable drive means for drivingly connecting said drive motor to said washing means, said washing means being disconnectable from said bottom wall and removable from said opening into said washing chamber independently of said drive motor.

3,963,047

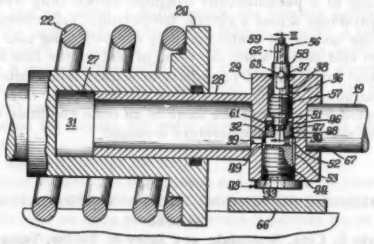
FILL AND RELIEF VALVE ARRANGEMENT

Rodger L. Moring, Bristol, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 17, 1975, Ser. No. 614,053

Int. Cl.² F15B *13/04;* **B62D** *55/30*

U.S. Cl. 137—596 **10 Claims**



1. A fill and relief valve arrangement for the introduction of fluid into and the selective venting of fluid from a fluid chamber comprising;

a body having a stepped open-ended bore extending therethrough, an integral annular shoulder formed at one end of the bore, a passageway communicating the bore with

such fluid chamber, and a vent port communicating the bore with the atmosphere;

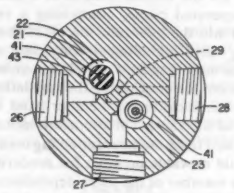
a valve seat element sealingly secured within the other end of the bore and having a passage formed therein communicating with said passageway; and

a fill valve adjustably positioned within the bore and having a first position in engagement with said valve seat element for isolating the fluid chamber from the vent port and a second position for establishing communication between the passageway and the vent port through said passage for venting the fluid chamber to the atmosphere, said fill valve including a fluid flow path extending therethrough and a check valve disposed in the flow path for permitting oneway communication of fluid therethrough in a direction for introducing fluid into the fluid chamber when the fill valve is in said first position, said fill valve being confined between the valve seat element and the annular shoulder.

3,963,048
POPPET VALVE ASSEMBLY

Larry L. Bowman, Kalamazoo County, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.

Filed Feb. 27, 1975, Ser. No. 553,468
Int. Cl.² F15B *13/044*
U.S. Cl. 137—596.17 4 Claims



1. A poppet-type valve assembly, comprising:

valve housing means having a pair of opposite end surfaces and also having first and second substantially parallel openings extending therethrough from one end surface to the other end surface thereof;

said housing means including annular means defining first and second annular valve seats associated with said first and second openings respectively, said valve seats being positioned intermediate the opposite ends of the respective opening and disposed so as to surround the respective opening and project radially inwardly relatively thereto, said first valve seat facing toward said one end surface of said housing means and said second valve seat facing toward the other end surface of said housing means;

said first valve seat dividing said first opening into first and second annular chambers located adjacent said one end surface and said other end surface respectively, and said second valve seat dividing said second opening into first and second annular chambers located adjacent said one end surface and other end surface respectively;

said housing means having formed therein (1) an inlet port communicating directly with the first chamber of said first opening for permitting a pressure fluid to be supplied thereto, (2) an exhaust port communicating directly with said first chamber of said second opening for permitting pressure fluid to be discharged therefrom, (3) a load port communicating directly with one of said second chambers for permitting the flow of pressure fluid to or from an external load, and (4) an internal passage providing direct flow communication between the second chamber of said first opening and the second chamber of said second opening;

first and second poppet-valve plunger means movably positioned within said first and second openings, respectively, and being movable for sealingly engaging the respective valve seat, each said poppet-valve plunger means including an elongated valve stem having first and second cylindrical guide portions spaced axially from one another and positioned within the respective first and second chambers of the respective opening;

each said valve stem also having a first annular groove positioned axially adjacent the first cylindrical portion and a second annular groove positioned axially adjacent the second cylindrical portion, said first and second annular grooves being identical and disposed between said first and second cylindrical portions, said first and second grooves also being positioned axially adjacent one another and separated by a narrow annular flange which is fixed to the valve stem and projects radially outwardly thereof;

a first elastomeric seal ring fixedly associated with said first plunger means and disposed within said first annular groove, said first elastomeric seal ring being positioned within the first chamber of said first opening whereby it is movable into sealing engagement with said first valve seat, a second elastomeric seal ring fixedly associated with said second plunger means and being disposed within said second annular groove, said second elastomeric seal ring being disposed within the second chamber of said second opening and positioned for sealing engagement with said second valve seat, each said elastomeric seal ring having an external diameter of a magnitude similar to the diameter of the adjacent cylindrical guide portions associated with the respective plunger means;

first elastomeric seal ring means associated with each of said first and second openings and disposed adjacent said one end surface for creating a slidable sealed relationship between said housing means and the first cylindrical guide portions of said first and second plunger means;

second elastomeric seal ring means associated with each of said first and second openings and disposed adjacent the other end surface of said valve housing means for creating a slidable sealed relationship between said housing means and the second cylindrical guide portions of said first and second plunger means;

each of said valve stems including an elongated rodlike extension projecting axially beyond one of the cylindrical guide portions and projecting outwardly beyond one of the end surfaces of said housing means; and

operator means coacting with said extensions for causing axial shifting movement of said valve plunger means, said operator means comprising solenoid means having an electromagnet fixed relative to said housing means and an armature which is movable relative to said housing means and said electromagnet, said armature being fixedly connected to said extensions whereby energization of said electromagnet causes movement of said armature which in turn causes a corresponding movement of said first and second valve plunger means.

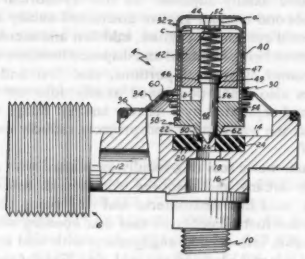
3,963,049
DUAL SEALING SOLENOID VALVE

William W. Beauregard, Agawam, Mass., assignor to Springfield Wire, Inc., Springfield, Mass.

Filed Jan. 17, 1975, Ser. No. 542,070
Int. Cl.² F16K *31/06, 25/00*
U.S. Cl. 137—614.18 4 Claims

1. Dual sealing valve comprising a valve seat including an orifice with a sealing surface coaxial and coplanar with the upper stream edge of said orifice, first and second closure members axially movable toward and away from said valve seat, an armature movable in response to actuation of a solenoid coil to retract both said first and second closure members to unseat the same, means associated with each of said closure members independently urging each toward said valve seat,

each closure member having a return stroke from its retracted position to sealing engagement with said orifice and sealing



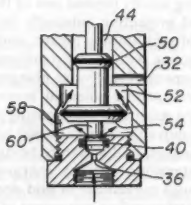
surface of sufficient extent to effect sealing of one independently of the other.

3,963,050

PNEUMATIC RELAY

Gerald F. Theriot, and Frank M. Hoofnagle, both of Houma, La., assignors to B.W.B. Controls, Inc., Houma, La.

Continuation of Ser. No. 394,849, Sept. 6, 1973, Pat. No. 3,877,484. This application Apr. 14, 1975, Ser. No. 567,927
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.² F15B 20/00; F16K 17/00
U.S. Cl. 137—625.66 1 Claim



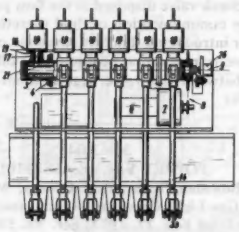
1. A valve comprising a valve body, an elongated bore within said body, a first fluid inlet port, an outlet port, a bleed port, second fluid inlet port, valve member slidable within said bore, means for positioning said valve member in a first position whereby communication is permitted between said first inlet port and said outlet port but communication is precluded between said bleed port and said outlet port, means for positioning said valve member in a second position whereby communication is permitted between said bleed port and said outlet port but is precluded between said first inlet port and said outlet port, and means for preventing pressure exerted against said valve member through said second inlet port from moving said valve member from said second position to said first position, wherein said preventing means includes first and second enlarged portions of said bore intermediate said second fluid inlet port and said first fluid inlet port, one of said enlarged portions sealingly accommodating said valve member and the other of said enlarged portions being of such greater diameter than said valve member as to not sealingly accommodate said valve member.

3,963,051

SYSTEM FOR THE REMOTE CONTROL OF THE JACK CYLINDERS OF A HYDRAULICALLY OPERATED CRANE

Hans-Jochen Kuhlmann, Bremen, Germany, assignor to Kuhlmann & Rust KG, Maschinenfabrik, Bremen, Germany

Filed Aug. 16, 1974, Ser. No. 498,126
Claims priority, application Germany, Aug. 31, 1973, 2343887
Int. Cl.² F16K 31/42
U.S. Cl. 137—637 6 Claims



1. A system for the remote control of a jack cylinder of a hydraulically operated crane, comprising a regulating valve for connection into the hydraulic circuit of the jack cylinder, said regulating valve including a body part and a movable member, means mounting said movable member in said body part for movement for controlling the regulation of the valve, the system further including a member fixed with respect to said body part of the valve, a shaft, means mounting said shaft for rotation in said fixed member, coupling means for coupling said shaft to said movable member for rendering the position of the movable member of the valve dependent on the angular position of said shaft, said coupling means including a linkage including a first arm having first and second ends, means for releasably coupling said first end of said first arm to said shaft, a connecting link having first and second ends, means pivotally connecting said first end of said connecting link with said second end of said first arm, a second arm generally parallel with said first arm, means mounting said second arm for pivoting about an axis fixed with respect to said fixed member, means pivotally connecting said second end of said connecting link with said second arm, and means connecting said movable valve member with said second arm, a measured value transducer coupled to said shaft for sensing the angular position of the shaft, reversible driving means for rotating said shaft,

control means including a portable actuating unit,

an adjustable set value transducer carried by said actuating unit,

a flexible lead connecting said actuating unit with the remainder of said system, and means in said control means operable to energize said driving means in the event of a difference between the position of said shaft indicated by said measured value transducer and the desired position set on said set value transducer to rotate said shaft so as to eliminate said difference.

3,963,052

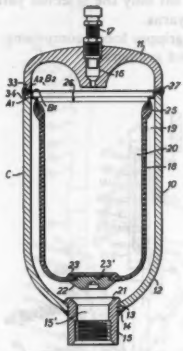
PRESSURE VESSEL

Jacques H. Mercier, 49 rue de Naples, Paris, France

Filed Feb. 20, 1973, Ser. No. 334,155
Int. Cl.² F16L 55/04
U.S. Cl. 138—30 14 Claims

1. In a pressure vessel comprising a rigid container having a substantially cylindrical body portion having a port at one end and a mouth having a rim at the other, and a cover member adapted to close said mouth and having a port, an annular supporting member in said container, a deformable partition having a rim bonded to said annular supporting member and

positioned in said container for defining two variable volume fluid chambers therein in communication respectively with said ports, and weld means retaining said body portion, and said cover member in fixed position, the improvement comprising said supporting member having a first positioning means formed integral therewith cooperating with the mouth of said cylindrical body portion to center said supporting



member and partition in said container, said supporting member having a second positioning means formed integral therewith and including a portion extending laterally outwardly at least over a portion of the rim of the body portion for cooperating with said cover member to position the latter in axial alignment with said body portion, and wherein said laterally extending portion is generally within said weld.

3,963,053

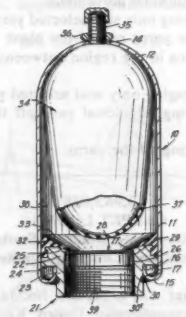
PRESSURE VESSEL

Jacques H. Mercier, 49 rue de Naples, Paris, France

Filed July 10, 1974, Ser. No. 487,167

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **1 Claim**



1. A pressure vessel comprising a container of rigid material having a cylindrical portion having an open end reversely bent inwardly relative to the cylindrical portion and terminating in an annular flange having a rim at its free edge, the reversely bent end between said cylindrical portion and said flange defining a semicircular portion, said flange extending substantially parallel to the cylindrical container portion beyond a diametrical line between the ends of the semi-circular portion, a closure assembly in said container, said assembly comprising a cylindrical plug having a reduced diameter sleeve extending axially therefrom and defining an annular shoulder, said shoulder engaging the rim of said flange, said reduced diameter sleeve being received through said annular flange, the latter being restrained from transverse inward movement by abutment against said sleeve, said container having a deformable bladder therein defining a gas chamber on opposed sides thereof and passage means leading into each of said chambers.

3,963,054

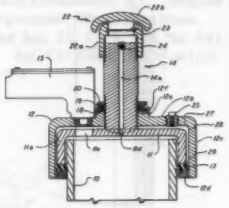
SEAL ASSEMBLIES FOR WATER-WELL CASINGS

Carlyle J. Martin, Pierce Creek Road, R.D. No. 1, Binghamton, N.Y. 13903

Continuation-in-part of Ser. No. 493,526, Aug. 1, 1974, Pat. No. 3,917,292, and a continuation-in-part of Ser. No. 595,851, July 14, 1975. This application Sept. 17, 1975, Ser. No. 614,132

Int. Cl.² F16L *55/10*

U.S. Cl. 138—89 **7 Claims**



1. A well seal assembly for sealing the upper end of a hollow cylindrical well casing, comprising, in combination: a generally-cup-shaped outer member having a downwardly-extending first annular flange portion adapted to surround the outside of the end of said well casing, a second annular flange portion affixed to and extending inwardly from said first flange portion toward said casing and a threaded central bore; a generally cup-shaped inner device disposed within said outer member and having an annular ring means surrounding said end of said casing; a compressible seal ring disposed between said annular ring means of said inner device and said second annular flange portion of said outer member; and shaft means threaded through said central bore of said outer member to engage said inner device, whereby rotation of said shaft means will move said outer member upwardly relative to said inner device to compress said seal ring between said second annular flange portion and said annular ring means, causing inward radial expansion of said seal ring against the outer wall of said casing.

3,963,055

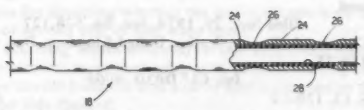
SELF-SEALING FUEL LINE

John DeRosa, P.O. Box 1211, Clear Lake Highlands, Calif. 95422

Filed Dec. 20, 1974, Ser. No. 534,739

Int. Cl.² F16L *9/14, 55/10, 9/00;* **F02B** *77/00*

U.S. Cl. 138—140 **1 Claim**



1. A conduit for a hazardous fluid comprising:

a continuous one-piece outer tubular metallic member with primary lengths thereof of a first diameter being formed of rigid material of a given thickness and having relatively high tensile strength;

rings of a ductile material and of a diameter smaller than said first diameter and of reduced thicknesses less than

the thicknesses of said primary lengths interposed between said rigid lengths at intervals along the length of said tubular member;

the metal of said tubular member having been softened at intervals to form said ductile rings; and

an inner tubular member of a resilient material effective when pinched to block fluid flow therethrough.

3,963,056

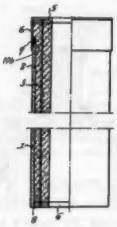
CONCRETE PILES, POLES OR THE LIKE

Atsumi Shibuya, Tokyo; Chokichi Sugita, Niiza, and Hiroshi Endo, Chiba, all of Japan, assignors to Nippon Concrete Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1974, Ser. No. 430,074

Int. Cl.[2] F16L 9/08

U.S. Cl. 138—175 3 Claims



1. Prestressed concrete piles, poles, or the like pillers comprising a tubular body of concrete having an outer surface and a cylindrical periphery, a pair of annular iron discs arranged at opposite ends of said concrete body, reinforcing pretensioned steel wires extending longitudinally through said concrete body and between said annular iron discs, a tubular steel plate covering the outer surface of said concrete body and having first and second ends, said tubular steel plate being welded at said first end thereof to one of said annular iron discs, whereas said second end of said tubular steel plate is free to move in relation to said concrete body, said tubular steel plate being shorter than said body of concrete and terminating in an unattached free end portion, said tubular steel plate covering the outer surface of said concrete body for a major portion of the length thereof, a second tubular steel plate covering a short remaining portion of the outer surface of said concrete body and being welded at one end thereof to the other of said iron discs, a second end of said second tubular steel plate overlapping the free end portion of said tubular steel plate.

3,963,057

METHOD OF MAKING PILE FABRICS AND THE PILE FABRIC MADE THEREBY

Geoffrey Wilson Dewhirst, Broughty Ferry, Scotland, assignor to Thomson Shepherd and Company Limited, Dundee, Scotland

Filed Nov. 29, 1974, Ser. No. 528,127

Claims priority, application United Kingdom, Dec. 4, 1973, 56119/73

Int. Cl.[2] D03D 39/08

U.S. Cl. 139—2 8 Claims

1. A method of increasing the length of selected tufts in each row of tufts produced by an Axminster gripper loom having yarn carriers and a gripper associated with each carrier, comprising the steps of:

a. gripping a plurality of yarns in the grippers,

b. drawing yarn off the yarn carriers by relative movement between the carriers and grippers, all the drawn yarns being in substantially a single plane in the region between the yarn carriers and the grippers,

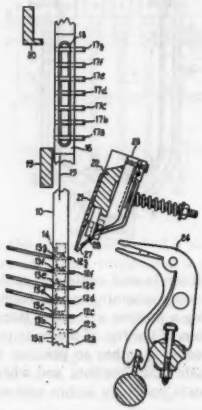
c. moving at least one selected yarn carrier so as to move its respective yarn out of the plane occupied by the unselected yarns in the region between the yarn carriers and the grippers,

d. moving an element crosswise of the yarns along a path such that the element engages only the selected yarn which has been moved out of the plane occupied by the unselected yarns so as to lengthen that yarn by drawing additional yarn off only the selected yarn carrier, and

e. cutting all the yarns.

4. An Axminster gripper loom comprising:

a. yarn carriers and grippers,



b. means for moving said yarn carriers and grippers relative to each other to draw lengths of yarn from the yarn carriers, all the drawn yarns being in substantially a single plane in the region between the yarn carriers and the grippers,

c. means for conditioning only selected ones of said yarn carriers for additional movement,

d. means for moving only said selected yarn carriers to shift their respective yarns out of the plane occupied by the unselected yarns in the region between the yarn carriers and grippers,

e. means for engaging only said selected yarns to lengthen them by drawing additional yarn off the selected yarn carriers, and

f. means for cutting all the yarns.

3,963,058

CARPET LOOMS

Geoffrey Wilson Dewhirst, Dundee, Scotland, assignor to Thomson Shepherd and Company Limited, Dundee, Scotland

Filed Mar. 26, 1975, Ser. No. 562,379

Claims priority, application United Kingdom, Mar. 26, 1974, 13308/74

Int. Cl.[2] D03D 39/02, 39/08

U.S. Cl. 139—2 8 Claims

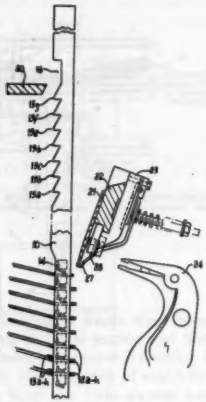
1. A method of increasing the length of selected tufts in each row of tufts produced by an Axminster gripper loom having yarn carriers and a gripper associated with each carrier, comprising the steps of:

a. gripping a plurality of yarns in the grippers,

b. moving all the yarn carriers away from said grippers, to draw yarn off the yarn carriers, and toward a lifting means into a position wherein a part of at least one selected yarn carrier is in the path of upward movement of said lifting means, all the drawn yarns being in substantially a single

plane in the region between the yarn carriers and the grippers,

c. raising said lifting means to move at least one selected yarn carrier so as to move its respective yarn out of the plane occupied by the unselected yarns in the region between the yarn carriers and the grippers,



d. moving an element crosswise of the yarns along a path such that the element engages only the selected yarn which has been moved out of the plane occupied by the unselected yarns so as to lengthen that yarn by drawing additional yarn off only the selected yarn carrier, and

e. cutting all the yarns.

3,963,059

BEATING-UP ARRANGEMENT FOR A WAVE-TYPE WEAVING MACHINE

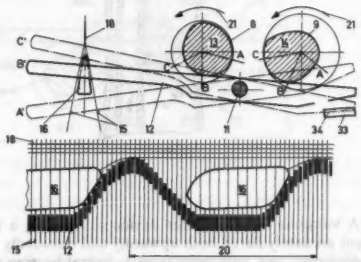
Edgar Strauss, Ruti, Zurich, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Zurich, Switzerland

Filed Nov. 22, 1974, Ser. No. 526,159

Claims priority, application Switzerland, Nov. 29, 1973, 16790/73

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 **5 Claims**



1. A travelling wave-type weaving machine with reed teeth arranged along an axis and adapted to be pivoted about the said axis, the reed teeth abutting with some play on driven cam-like guide surfaces which on rotation cause pivoting movement of the reed teeth about the axis, the reed teeth producing movement of shuttles and the beating-up of the weft thread in one of the end positions of the said teeth, the said reed teeth forming in their entirety a wave-like periodic curve formed by the ends of the teeth moving towards their beat-up position, the said cam-like guide surfaces having first section and second section, said first section moving said shuttle and having a profiled guide surface that produces a substantial variation in the spacing of the guide surface from its axis of rotation, the first section merging into said second section that produces the beat-up position of the reed tooth, said second section having a profiled guide surface that immediately produces a linear variation of the spacing of the guide surface from its axis of rotation, which is less than the variation of the first section and extends to the immediate vicinity of the beat-up point so that an abrupt change in movement of the reed teeth from high speed in the first section for shuttle movement to lower speed in the second section is produced to prevent over-shooting of the reed teeth at the beat-up line.

3,963,060

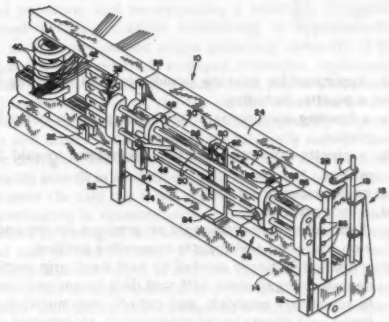
SHUTTLE DRIVE FOR A NARROW WARE LOOM

Raymond F. Dion, Greensboro, N.C., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Jan. 21, 1975, Ser. No. 542,748

Int. Cl.² D03D *35/00, 43/00*

U.S. Cl. 139—137 **18 Claims**



1. In a narrow ware loom having a frame, a warp shed, batten supporting means pivotally mounted on the frame, a batten mounted on said supporting means for vertical movement relative to said supporting means to any one of several positions, and a plurality of shuttles mounted on said batten for vertical movement therewith and for horizontal movement on said batten from a first side of said warp to a second side thereof, said shuttles being vertically spaced from each other so that only one of said shuttles is active by being aligned with said warp shed for each of the several positions of said batten, means for moving said active shuttle through said warp shed comprising:

a. means for detecting whether the active shuttle is on the first or second side of said warp shed;

b. first actuating means mounted on said supporting means for horizontal movement relative thereto for moving said active shuttle from the first side of said warp shed to the second side thereof;

c. second actuating means mounted on said supporting means for horizontal movement relative thereto for moving said active shuttle from the second side of said warp shed to the first side thereof;

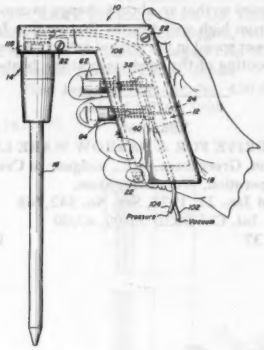
d. control means operatively connected to said detecting means for activating said first actuating means when said active shuttle is on the first side of said warp shed and for activating said second actuating means when the active shuttle is on the second side of said warp shed.

3,963,061

APPARATUS FOR DRAWING LIQUIDS INTO, AND EXPELLING LIQUIDS FROM A PIPETTE

James W. Kenney, West Chester, Pa., assignor to Drummond Scientific Company, Broomall, Pa.

Filed Sept. 16, 1975, Ser. No. 613,894
Int. Cl.² B65B 3/18
U.S. Cl. 141—21 16 Claims



1. Apparatus for drawing liquid into, and expelling liquid from a pipette, including:

a. a housing comprising a hand grip portion and a barrel portion,

b. a pipette-supporting portion connected to said barrel portion,

c. an air pressure source,

d. a vacuum source,

e. duct means connecting said air pressure source and vacuum source to said pipette-supporting portion,

f. a first valve means carried by said hand grip portion in operative engagement with said duct means and operable to selectively establish, and cut off, communication between said pipette-supporting portion, air pressure source and vacuum source, and

g. a second valve means in said pipette-supporting portion for preventing passage of liquid from the pipette through said pipette-supporting portion to said housing but permitting free passage of air therethrough.

3,963,062

CATALYST CHANGER FOR UNDERFLOOR TYPE CATALYTIC CONVERTER

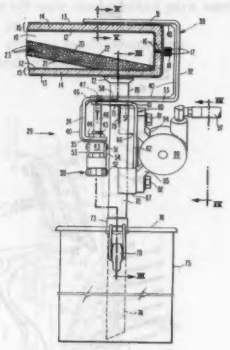
John F. Stahl, Exton, Pa., assignor to Oxy-Catalyst, Incorporated, West Chester, Pa.

Filed Aug. 16, 1974, Ser. No. 497,946
Int. Cl.² B65B 1/08
U.S. Cl. 141—67 8 Claims

1. A catalyst changer for a catalytic converter having a casing, a supply of catalytic material within the casing and a fill hole in the casing in communication with the supply of catalyst material, said changer including:

a. a vertical conduit for conducting catalyst material from and to the converter, the top portion of said conduit being engageable in said fill hole and having adjacent to the top thereof a fitting adapted for engagement with said fill hole,

b. a frame for supporting said conduit from said converter, said frame including means for engaging the top of said converter and also including a portion disposed below and spaced from said converter, means engageable with said conduit for advancing said conduit toward and retracting it from said fill hole and for squeezing and rigidly clamping said casing between said top engaging means and said conical fitting when said top portion of said conduit is engaged with said fill hole with said conduit disposed in fully advanced position, and



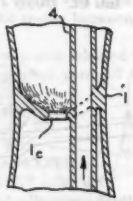
c. a vibrator securely mounted on said conduit for imparting vibrations thereto and through said conduit to said converter during removal and replacement of its supply of catalyst material.

3,963,063

VISCOUS LIQUID TRANSFER DEVICE

Robert S. Pascarella, 600 B Kelly Ave., Pittsburgh, Pa. 15221

Filed Aug. 28, 1974, Ser. No. 501,147
Int. Cl.² B65B 3/06
U.S. Cl. 141—309 1 Claim



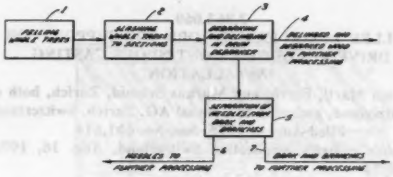
1. A viscuous liquid transfer device comprising a tubular element arcuately flared both upwardly and outwardly as well as downwardly and outwardly from a central portion thereof to accomodate varying sizes of the necks of a bottle to be emptied and one to be filled, respectively, a funnel shaped ring integrally extending from and integrally molded with the inner wall of the central portion of said device, a vent tube extending vertically through a portion of said funnel shaped ring, and having an upper portion extending above said tubular element well into the neck of the bottle to be emptied, and a lower portion totally enclosed in said tubular element whereby it will pierce the contents of the bottle to be emptied, the top portion of said vent tube being closed and a vent opening being provided in the side of the vent tube adjacent to the top portion.

3,963,064

PROCESSING WHOLE TREES

George T. Hayes, Temiscnaning, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Jan. 27, 1975, Ser. No. 544,633
Int. Cl.² B27L 1/00; A01G 23/08
U.S. Cl. 144—309 AC 4 Claims



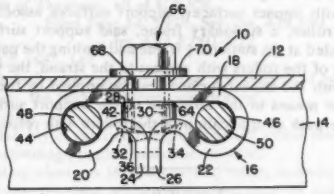
1. A method of harvesting whole trees comprising felling whole trees including the bole section and normally unmerchandizable top section, branches and needles, delivering said whole trees to a mill, slashing each of said whole trees into a top section and at least one bole section having branches feeding said sections into one end of a de-barking drum and de-barking and at least partially de-limbing said sections in said drum; rejecting de-barked wood from the other end of said drum and also rejecting a bark branch and needle fraction through the periphery of said drum and collecting said bark, branch and needle fraction for further processing.

3,963,065

MOUNTING BRACKET

Fred R. Dauwalder, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 1, 1975, Ser. No. 573,682
Int. Cl.² F16B 39/00
U.S. Cl. 151—41.76 7 Claims



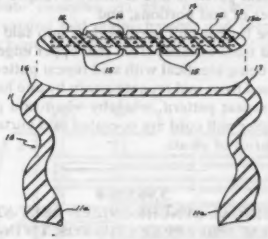
1. Mounting bracket means comprising a substantially flat bracket body portion, a separate first fastener means portion, a pair of curved bracket body portions on either side of said substantially flat bracket body portion and defining respective openings therethrough, bolt fastener means disposed through said respective openings, and means for capturing said first fastener means portion within said mounting bracket means comprising a pair of extension portions extending toward each other from the respective curved bracket body portions so as to captively and non-rotatably hold thereby said first fastener means portion between said flat bracket body portion and said extension portions.

3,963,066

REVERSIBLE REPLACEABLE TREAD TIRE

Kenneth P. Schwartz, 2604 N. Emerald Drive, Fairborn, Ohio 45324, and Paul M. Wagner, 2268 Andrew Road, Dayton, Ohio 45440

Filed Mar. 25, 1975, Ser. No. 561,768
Int. Cl.² B60C 11/02, 9/18
U.S. Cl. 152—187 1 Claim



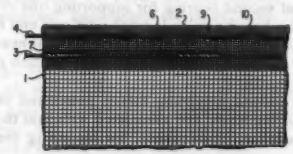
1. In a vehicle and/or aircraft tire; an inflatable pneumatic tire carcass adjustable between first, deflated and second, inflated positions, and incorporating a relatively elongated, tire tread-receiving channel terminating in oppositely-disposed, and arcuate-shaped ridges extending upwardly of the said channel; and a relatively enlarged, reversible, replaceable tread belt initially mountable directly over, and in a somewhat spaced relation relative to, the tire carcass when the latter is in its first, deflated position, and having oppositely-disposed outside and inside surfaces made of a relatively enlarged and specific configuration to subsequently precisely accommodate and exactly interfit in a relatively tight-fitting and non-slipping engagement the said tire tread-receiving channel of, and further terminating in opposite ovate-shaped, side-end portions engageable in a snug-fit and substantially streamlined relation to, and still further forming a natural extension from said oppositely-disposed, ridges of said tire carcass when the latter is in its second, inflated position; said tread belt further having a separate and differently configured-tread pattern respectively molded on the said outside and inside surfaces thereof to thereby enable the selective positioning of the particular tread pattern on the ground that is best suited for the specific ground surface or prevailing weather conditions, by the relatively quick manual reversal of said tread belt on said tire carcass to a pre-selected position.

3,963,067

PLEATABLE CURTAIN

Alfred Scholer, Wuppertal, Germany, assignor to Vorwerk & Sohn, Textil- und Gummiwerke, Wuppertal-Barmen, Germany

Filed June 24, 1975, Ser. No. 589,850
Claims priority, application Germany, July 1, 1974, 2431465
Int. Cl.² A47H 13/14
U.S. Cl. 160—348 10 Claims



1. A pleatable curtain comprising:

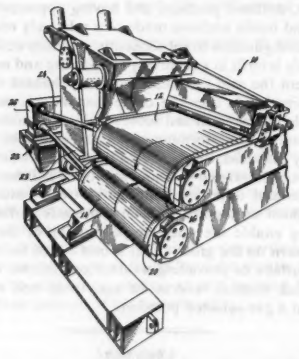
a curtain having a front side, a back side and an upper edge;
hanging means for hanging said curtain affixed at said upper edge; and
pleating means for pleating said curtain, comprising
at least one pull cord worked into said front side at a first fixed distance from said upper edge in a repeat pattern, said repeat pattern comprising a plurality of portions, wherein said pull cord is movably enclosed over at least one of said portions and is freely arranged over at least one other of said portions; and
at least one further pull cord worked into said back side at a second fixed distance from said upper edge in a further pattern being identical with said repeat pattern and being transposed from said repeat pattern by one half the length of said repeat pattern, whereby when said pullcord and said further pull cord are operated said curtain is formed into a series of pleats.

3,963,068

SYMMETRICAL SYNCHRONIZED BELT-STEERING SYSTEM AND APPARATUS FOR TWIN-BELT CONTINUOUS METAL CASTING MACHINES

Robert William Hazelett, Winooski; John Frederick Barry Wood, Burlington, and Robert J. Carmichael, Colchester, all of Vt., assignors to Hazelett Strip-Casting Corporation, Winooski, Vt.

Division of Ser. No. 350,600, April 12, 1973, Pat. No. 3,878,883. This application Apr. 21, 1975, Ser. No. 570,208
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—278 **4 Claims**



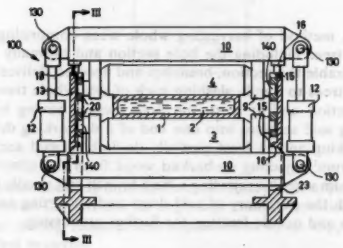
1. A symmetrical synchronized belt-steering system for use in a twin-belt continuous metal casting machine of the type in which a casting region is defined between spaced parallel portions of the two casting belts, said system comprising:
a frame for supporting and revolving a casting belt, said frame having a pair of main rolls at opposite ends, said rolls extending parallel to each other and also parallel to the plane of the casting region for defining an oval shaped path around which the casting belt is revolved,
a first and second bearing for supporting one of said rolls, said first bearing being located near one end of said one roll and said second bearing being located near the other end of said one roll for allowing for rotation of said one roll
first and second mounting means positioned on opposite sides of the frame and associated with said first and second bearings, respectively, for mounting them on the frame,
first and second steering means positioned on opposite sides of the frame for moving said first and second mounting means, respectively toward and away from the plane of the casting region for steering the belt, and
synchronizing means connected between said first and second steering means for causing said first and second mounting means simultaneously to move equal amounts in opposite directions effectively toward and away from the plane of the casting region when said synchronizing means are actuated for skewing said one roll symmetrically with respect to the frame for steering the casting belt.

3,963,069

ROLLER APRON FRAMEWORK FOR SUPPORT- OR DRIVE ROLLS OF A CONTINUOUS CASTING INSTALLATION

Heinrich Marti, Forch, and Markus Schmid, Zurich, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Aug. 4, 1975, Ser. No. 601,614
Claims priority, application Switzerland, Aug. 16, 1974, 11225/74
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—282 **8 Claims**



1. A roller apron framework for support- or drive rolls of a continuous casting installation for casting a strand moving in a predetermined direction of travel along at least one guide path for the strand, a common pivotable yoke, two successive rollers following one another in the direction of travel of the strand located at the region of the at least one guide path in said common pivotable yoke, piston-cylinder means for moving said yoke substantially transversely with respect to a surface of the strand guided by said rollers, said yoke being provided with impact surfaces, support surfaces associated with each roller, a stationary frame, said support surfaces being provided at the stationary frame and limiting the path of application of the rollers with respect to the strand, the yoke provided with the impact surfaces can be applied by the piston-cylinder means in the direction of the support surfaces limiting the path of application of the rollers with respect to the strand.

3,963,070

CONDITION CONTROLLING AIR FLOW DAMPER

Raymond L. Alley, Toledo, Ohio, and Miguel A. Ordorica, Temperance, Mich., assignors to American Warming and Ventilating Inc., Toledo, Ohio

Filed Feb. 18, 1975, Ser. No. 550,848
Int. Cl.[3] F01P *7/10*
U.S. Cl. 165—98 **19 Claims**

1. A multi-blade control damper for a duct through which there flows a varying volume of air for the control of a condition in the duct, said damper comprising
a. a frame,
b. at least one first blade extending across said frame and pivotally mounted therein for movement on an axis extending across said frame, between closed and open positions,
c. means for moving said first blade to adjust for major changes in the condition to be controlled.

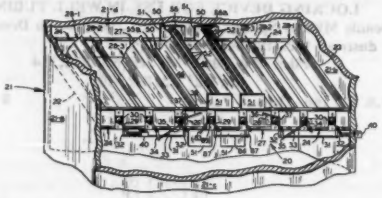
d. at least one second blade extending across another portion of said frame and pivotally mounted therein for movement on an axis extending across said frame between closed position and open position,

e. at least one baffle mounted in and extending across said frame parallel to the axis of said second blade,

1. a first edge of said baffle that is adjacent the edge of said second blade when in closed position being spaced from the axis of said second blade a distance substantially equal to the width of said second blade between the axis and that edge thereof,

2. an opposite edge of said baffle being spaced from the axis of said blade a greater distance than the said first edge of said baffle, and

f. means for moving said second blade between closed and open positions and to positions there-between by which movements the changes in the opening between the edge of said blade and said baffle are proportional to minor changes in the condition to be controlled.



3,963,071

CHELL-AND-TUBE HEAT EXCHANGER FOR HEATING VISCOUS FLUIDS

Evgeny Sergeevich Levin, ulitsa Sofiiskaya, 48, korpus 3, kv. 129; Vladimir Andreevich Permyakov, 2 Murinsky prospekt, 10, kv. 116, both of Leningrad; Nikolai Vasilievich Zozulya, ulitsa Reiterskaya, 30, kv. 6, Kiev; Igor Yakovlevich Shkuratov, ulitsa Semashko, 21, kv. 152, Kiev; Boris Leonidovich Kalinin, Muzeiny pereulok, 2, kv. 9, Kiev; Boris Fedorovich Vakulenko, ulitsa P. Tolyatti, 14, kv. 49, and Pavel Ivanovich Podgorochny, ulitsa P. Tolyatti, 20, kv. 61, both of Taganrog, all of U.S.S.R.

Filed June 14, 1974, Ser. No. 479,590

Int. Cl.[2] F28D 7/12

U.S. Cl. 165—142 **6 Claims**

1. A heat exchanger for heating a viscous fluid by a heating medium, the heat exchanger comprising:

a shell;

a plurality of external tubes distributed within said shell and extending longitudinally therewithin;

heating elements in said external tubes, including internal tubes disposed within respective ones of said external tubes to form first clearance spaces therewith, and additional tubes disposed within said internal tubes to form second clearance spaces therewith;

first and second plug means respectively closing said internal and said additional tubes at one of the ends thereof;

plate means securing said external tubes, said internal tubes and said additional tubes within said shell to form a receiver chamber, a front chamber, a main chamber, and an intermediate chamber;

means for introducing the heating medium into said additional tubes, whereby the medium traverses the latter;

said additional tubes being provided with outlet means adjacent said second plug means to permit the heating medium to flow into said second clearance spaces;

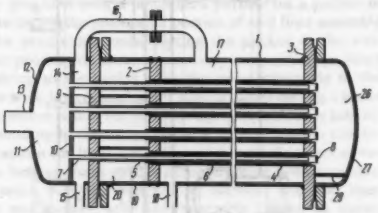
said receiver chamber being open to said second clearance spaces; a discharge outlet for condensate in said receiver chamber at the bottom thereof;

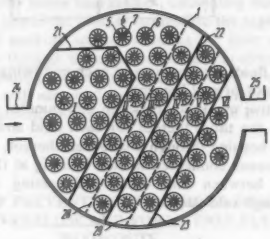
means for conveying the heating medium from said receiver chamber, at the top thereof, to said main chamber;

inlet means for supplying the viscous fluid to said front chamber;

said intermediate chamber being open to said first clearance spaces at the end thereof;

partition means in said front and said intermediate chambers, defining successive sections therein for causing the viscous fluid to flow from said front chamber to said intermediate chamber via said first clearance spaces while traversing said main chamber and thence successively back and forth between said intermediate and said front chambers, whereby the viscous fluid is heated in said main chamber by the heating medium flowing around said external tubes and flowing in said first clearance spaces;





outlet means in said main chamber for discharge of spent heating medium, and discharge means in said front chamber for the heated viscous fluid;

said partition means being arranged in said front and said intermediate chamber so that the number of said external tubes and associated heating elements therein is successively reduced in said sections, thereby taking into account the decreased viscosity of the viscous fluid as it is successively heated in said sections.

3,963,072

DOUBLE-FLOW REGENERATOR

Norbert Wagner, Schlederloh, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Nov. 21, 1974, Ser. No. 526,007

Claims priority, application Germany, Nov. 22, 1973, 2358276

Int. Cl.[2] F28D 7/10

U.S. Cl. 165—157 **2 Claims**

1. A double-flow regenerator for a gas-rectification plant adapted to pass a multiplicity of fluids into mutual indirect heat exchange, said regenerator comprising:

an elongated housing having opposite ends;

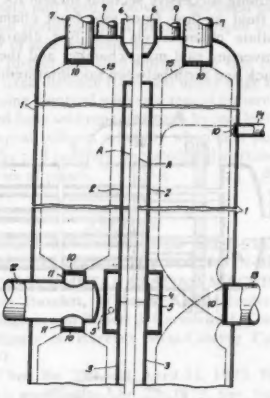
a core tube extending longitudinally through said housing centrally thereof;

a pair of coiled-tube bundles axially spaced apart in said housing and surrounding said core tube, each of said

bundles comprising a plurality of coiled tubes, the coiled tubes of said bundles constituting the only heat-exchange tubes extending within said housing;

a regenerator packing filling said housing around said tubes;

a plurality of conduits at each end of said housing, each conduit communicating with a plurality of coiled tubes of a respective bundle for conducting a respective one of



said fluids the conduits at each end being spaced around the axis of said housing;

respective manifolds between said bundles communicating with the tubes thereof for each fluid and leading out of said housing through a side wall thereof; and

duct means connected to said housing at the ends thereof and between said stacks for passing a further fluid through said packing.

3,963,073

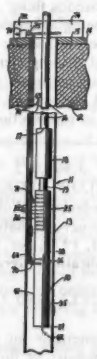
PURGING APPARATUS

Claude C. Laval, Jr., 2444 Farris Ave., Fresno, Calif. 93705

Division of Ser. No. 396,522, Sept. 12, 1973, abandoned. This application June 25, 1975, Ser. No. 590,036

Int. Cl.[2] E21B *43/00*

U.S. Cl. 166—105.1 **20 Claims**



1. In combination with a pump having a fluid intake adapted for insertion in a well, said pump mounting a particle separating device on the intake thereof, a purging apparatus comprising a particle collection housing mounted on the separating device having a particle receiving opening communicating with the separating device; means mounted on the housing for selectively opening and closing said opening; a source of fluid under pressure connected to the housing; a vortex tube mounted on the housing and having a slot therein communicating with the collection housing, said slot defining a path of fluid travel oblique to the tube; and a discharge conduit secured on the tube.

3,963,074

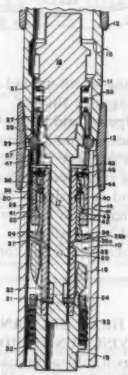
LOCKING DEVICE FOR USE IN WELL TUBING

Dennis Mitchel Spriggs, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 30, 1975, Ser. No. 582,314

Int. Cl.[2] E21B *23/02*

U.S. Cl. 166—206 **9 Claims**



1. A lock device for suspending flow control means in a landing nipple in an oil well tubing string, said lock device comprising:

an inner mandrel assembly having means at the top for connecting to a wireline;

tubular locking means located on said mandrel assembly in an encircling relationship thereon, said locking means adapted to pass through a tubing string and landing nipple in a first position thereof, and further adapted to engage a landing nipple in a second position thereof;

means on said mandrel assembly for selectively moving said locking member from said first position to said second position; and,

wherein said locking means comprises a tubular, partially rotatable locking member slidably located on said sleeve means and arranged to be rotated into engagement with a landing nipple.

3,963,075

CENTRALIZER FOR ELASTOMER COATED BLAST JOINT

Orde R. Evans, P.O. Box 51303, O.C.S., Lafayette, La. 70501

Filed Mar. 27, 1975, Ser. No. 562,576

Int. Cl.[2] E21B *17/10*

U.S. Cl. 166—241 **1 Claim**

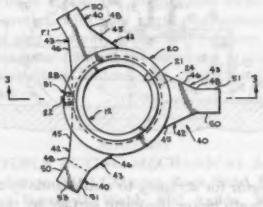
1. A centralizer for an elastomer coated blast joint including:

a. an elastomer body having a split extending longitudinally thereof and an opening extending longitudinally through said body with which the split communicates;

b. a plurality of longitudinally spaced rings molded in said body adjacent said longitudinal opening, said rings being

split to coincide with the split in said elastomer body and having portions extending substantially at right angles to said rings at said split with an opening therethrough whereby said elastomer body may be closed and positioned on a blast joint;

c. said elastomer body having three projections extending longitudinally of said body in circumferentially equidistant spaced relationship; and



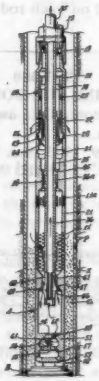
d. each of said projections having a pair of longitudinally extending side surfaces with each side surface including a first portion extending at an angle from said body to a predetermined point and an additional portion extending parallel from the termination of each of the first portions and in planes perpendicular to said body.

3,963,076

METHOD AND APPARATUS FOR GRAVEL PACKING WELL BORES

Larry K. Winslow, Edmond, Okla., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Mar. 7, 1975, Ser. No. 556,099
Int. Cl.² E21B *43/04, 43/10*
U.S. Cl. 166—278 **19 Claims**



1. Apparatus for use in a subterranean well having a production zone and a packer set in the well above the zone comprising: a tubular liner assembly adapted to depend from the packer within the production zone and to communicate with an outer tubular string operatively associated with the packer and extending to the top of the well, said liner assembly including a tubular portion having perforations through which fluids can flow to the interior of said assembly, said assembly having an upper passage through which fluent material can flow between the interiors of the outer tubular string and liner assembly to the exterior of said liner assembly below the packer, said assembly further having a lower passage through which fluids can flow between the interior and exterior of said assembly, an inner tubular member within said liner assembly adapted for connection to an inner tubular string extending through the outer tubular string to the top of the well, said inner tubular member being communicable with the interior of said assembly, and with said lower passage, said inner tubular member defining an annular space with said assembly communicable with the annular space between the inner and outer tubular strings, and valve means for selectively controlling fluid flow between said inner tubular member and tubular portion, said inner tubular member and lower passage, and said inner tubular member and annular space between the tubular strings.

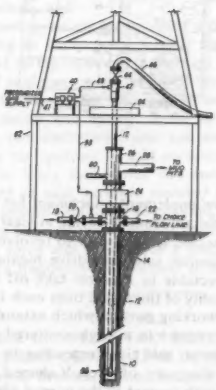
15. A method of gravel packing a production zone in a subterranean well comprising the steps of lowering a liner assembly provided with a perforated portion on a packer in the well to locate the perforated portion of said liner assembly within the production zone, setting the packer in the well above the production zone, operatively connecting an outer tubular string to the packer with the string extending to the top of the well, lowering an inner tubular string having a lower tubular member within the outer string, with said inner tubular string extending to the top of the well, to position the tubular member within the liner assembly and to provide a first annular space between said strings communicable with a second annular space between said tubular member and said liner assembly and packer, said liner assembly having an upper passage above said perforated portion establishing communication between said second annular space and the exterior of said liner assembly below said packer, circulating fluid downwardly through one of the tubular strings into the region of the well below said packing and surrounding the liner assembly for upward flow through the other of the tubular strings to the top of the well, and pumping gravel down one of the tubular strings into the well surrounding the liner assembly to fill the annular space around the perforated portion of the liner assembly.

3,963,077

METHOD OF PREVENTING WELL BORE DRILLING FLUID OVERFLOW AND FORMATION FLUID BLOWOUTS

Ben V. Faulkner, 1904 Westbrook Terrace, Norman, Okla. 73069

Filed June 18, 1975, Ser. No. 587,914
Int. Cl.² E21B *23/00*
U.S. Cl. 166—315 **5 Claims**



1. A method of preventing drilling fluid overflow and the occurrence of uncontrolled formation fluid blowouts when removing drill pipe sections from a drill string disposed in a well bore penetrating a subterranean formation and filled with drilling fluid comprising the steps of:

a. introducing a gas into the annulus between the walls of said well bore and said drill string until a predetermined gas pressure is reached therewithin thereby displacing drilling fluid downwardly within said annulus and upwardly through said drill string to lower the level of drilling fluid in said annulus a distance such that upon releasing the gas pressure from said annulus the resulting level of drilling fluid in said drill string is below the level at which said drill pipe sections are disconnected therefrom, but the level of drilling fluid in said well bore is above the level at which the hydrostatic head exerted on said formation by said drilling fluid equals the pressure of fluids contained within said formation;

b. releasing said gas pressure from said annulus;

c. removing a predetermined number of drill pipe sections from said drill string thereby raising said drill string within said well bore and lowering the level of drilling fluid therein, the number of such sections removed being limited so that the level of drilling fluid in said well bore is maintained above the level at which the hydrostatic head exerted on said formation by said drilling fluid equals the pressure of fluids contained within said formation;

d. refilling said annulus with drilling fluid; and

e. repeating steps (a) through (d) until the desired number of drill pipe sections are removed from said drill string.

3,963,078

SOIL CULTIVATING IMPLEMENTS

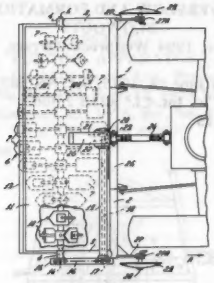
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Nov. 19, 1973, Ser. No. 417,366

Claims priority, application Netherlands, Nov. 22, 1972, 7215773; Mar. 6, 1973, 7303081

Int. Cl.² A01B *33/00*

U.S. Cl. 172—119 **16 Claims**



1. A rotary plow implement attachment for connection to a prime mover, said attachment having at least one rotor and drive means connected to said rotor to revolve same about a substantially horizontal axis, said drive means including an imput shaft connectable to a power take off and said rotor comprising a plurality of tines, said tines each having an elongated active soil working portion which extends substantially tangentially with respect to a circle centered on the axis of rotation of said rotor, said tines extending in V-shaped row relationship and the point of each V-shaped row being directed forwardly with respect to the normal direction of rotation of said rotor to penetrate the soil first, said tines having outer soil engaging means that are substantially flattened in generally horizontal planes, said tines being positioned adjacent one another to act in unison on the ground to cut free slices of soil across the width of said rotor and for lifting the free slices of soil upwardly.

3,963,079

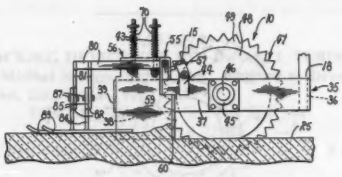
CULTIVATOR

James J. Carlucci, 716 Monroe Ave., Los Banos, Calif. 93635

Continuation-in-part of Ser. No. 369,912, June 14, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 519,331

Int. Cl.² A01B *13/00, 35/18, 35/24, 65/06*

U.S. Cl. 172—200 **4 Claims**



1. A cultivator for scraping to a substantially constant predetermined depth below the earth surface by reacting to elevational variations of the surface, comprising a frame adapted for earth traversing movement in a predetermined direction of travel and having a pair of forwardly convergent frame members; a pair of earth engaging scraper blades having scraper edges; means mounting the scraper blades on the frame members for elevational movement oblique to the intended direction of travel, said blades being horizontally adjustable on their respective frame members to and from engagement with each other, said blade mounting means including a rod fastened on each frame member in upstanding relation and wherein each blade mounts a top plate having a slot defining an axis substantially parallel to its respective blade through which its respective rod extends for horizontal adjustment of the blade relative to the frame member; earth gauge means, having an earth contact surface, secured on each blade with the contact surface disposed in a predetermined elevational position relative to the edge; and resilient means for urging the blade and gauge means into earth engagement including a spring assembly secured on each rod in engagement with its respective top plate.

3,963,080

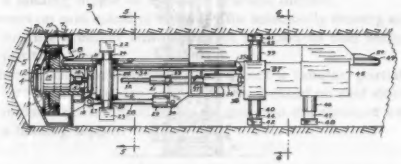
TUNNELING MACHINE FOR BORING A SIDE DRIFT

Ross W. Walker, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 29, 1975, Ser. No. 545,286

Int. Cl.² E21D *9/10*

U.S. Cl. 175—94 **6 Claims**



1. In an earth boring machine for forming an excavation by disintegrating earth formations, said earth boring machine including main beam means, primary gripper means for contacting the sidewalls of the excavation, cutterhead means connected to said main beam means for disintegrating earth formations, and power means coupled to said cutterhead means for providing power to said cutterhead means, said excavation normally having sidewalls, a back and an invert, but occasionally lacking one or both of the sidewalls, the improvement comprising:

secondary gripper means in sliding contact with said main beam means for establishing a reaction base to allow the cutterhead means to be forced into contact with the earth

formations under conditions where said excavation lacks one or both of the sidewalls, said secondary gripper means including

a first gripper unit for engaging the invert and back of the excavation,

a second gripper unit for engaging the invert and back of the excavation, and

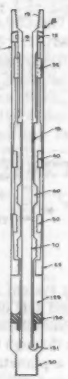
thrust means operably connected between said second gripper unit of said secondary gripper means and said cutterhead means for forcing said cutterhead means into contact with said earth formations, said thrust means also operably connected between said primary gripper means and said cutterhead means for forcing said cutterhead means into contact with said earth formations.

3,963,081

DOUBLE ACTING MECHANICAL JAR

Edwin A. Anderson, 1104 Chimney Rock Road, Houston, Tex. 77027, and Derrel D. Webb, 802 Axilda, Houston, Tex. 77017

Filed Apr. 24, 1975, Ser. No. 571,093
Int. Cl.² E21B *1/10*
U.S. Cl. 175—304 **19 Claims**



19. In a mechanical jar for connection in a well string having an outer housing with a mandrel longitudinally, but nonrotatably movable relative to the housing whereby a predetermined force may be applied to the mandrel to deliver the jar, the invention comprising:

a. means on the mandrel engagable upon movement of the mandrel relative to the housing in either direction for locking the mandrel and housing together; said means disengaging upon continued movement of the mandrel in the same direction that locked the mandrel and housing together for imparting a jar to the well string; and

b. said means being constructed and arranged so that said means is fully engaged by a predetermined force on the mandrel prior to disengagement to deliver a predetermined jar to the well string, said means including:

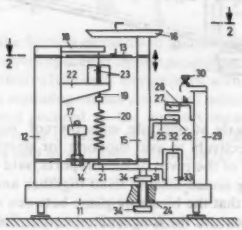
1. spaced sleeve means on the housing;
2. spaced annular body means on the mandrel;
3. annular ridges on said sleeve means arranged in unequal, longitudinally spaced increments therein; and
4. annular ridges on said body means arranged in unequal, longitudinally spaced increments whereby as the mandrel moves one of said body means into one of said sleeve means to engage therewith for imparting a jar, only one of said ridges on said body means engages and moves over one of said ridges on said sleeve means until said body means is telescoped in said sleeve means whereupon each of said ridges on said sleeve means is engaged with a corresponding annular ridge on said body means to thereby inhibit premature release of the mandrel and housing until the predetermined force is applied to the mandrel.

3,963,082

FORCE MEASURING APPARATUS OF THE VIBRATORY STRING TYPE

Eugen Meier, Meilen, Switzerland, assignor to Mettler Instrumente AG, Zurich, Switzerland

Division of Ser. No. 359,258, May 11, 1973, Pat. No. 3,897,681, which is a continuation-in-part of Ser. No. 252,458, May 11, 1972, abandoned. This application May 1, 1975, Ser. No. 573,560
Int. Cl.² G01G *3/14*; G01L *5/12*
U.S. Cl. 177—210 **9 Claims**



1. Force measuring apparatus of the type including at least one oscillatory string the frequency of oscillation of which affords an indication of the magnitude of a load to be measured, comprising

a. a stationary frame member;

b. a movable pan carrier member connected for vertical movement between normal no-load and full-load positions relative to said frame member;

c. oscillatory string means connected under tension between said frame and pan carrier members, said string means including at least one string member connected at one end with one of said frame and pan carrier members, and a spring member connecting the other end of said string member with the other of said frame and pan carrier members; and

d. compensating means for applying a corrective force on said string to compensate for the non-linearity of said string and spring members throughout the entire range of travel of said pan carrier member between said no-load and full-load positions, said compensating means including non-linear coil spring means (35, 37) connected between said stationary frame and movable pan carrier members for applying to said oscillatory string means a correction force that varies non-linearly with the displacement of said movable member from said no-load position toward said full-load position, thereby to modify the dependency of the frequency change of the string on the load force and to produce a linear variation in the oscillating frequency with respect to load.

3,963,083

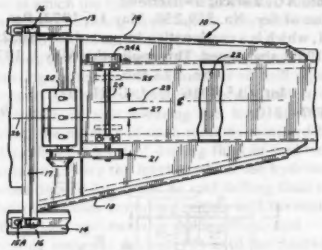
SNOWMOBILE CONSTRUCTION HAVING DRIVE BELT OFFSET FROM CENTER LINE OF SKI SPINDLES

Gerald D. Reese, Brooten, Minn., assignor to Scorpion, Inc., Crosby, Minn.

Filed May 23, 1975, Ser. No. 580,298
Int. Cl.² B62M *27/02*
U.S. Cl. 180—5 R **1 Claim**

1. A snowmobile construction for a snowmobile requiring turning at high rates of speed, said construction providing a tendency to turn in one direction or the other when at high

speed including a frame, an endless traction drive belt engaging a supporting surface and driving said snowmobile, said drive belt having a longitudinally extending center line, steering means at the forward end of the snowmobile comprising a pair of skis spaced apart from each other and supporting the forward ends of said snowmobile, a cross axle fixed to said frame at the forward end thereof, a pair of separate supports each having a pivot support, each of said supports being fixed



to said cross axle at opposite ends thereof, means to mount said skis respectively to said supports for steering movement about the axis of the pivot of the supports, said cross axle and supports being nonadjustably fixed together and to the frame in position so that the bisecting plane between said pivot axes of said supports and the longitudinal center line of said drive belt are offset sufficiently to create a steering moment in one direction when the snowmobile is being turned at substantial speeds.

3,963,084

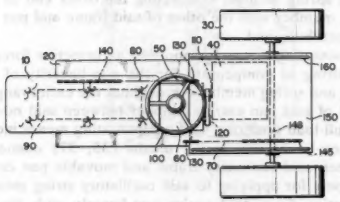
THREE WHEEL AGRICULTURAL TRACTION UNIT

Peter Misan, Nelson, Canada, assignor to The Raymond Lee Organization, New York, N.Y.

Filed June 25, 1975, Ser. No. 590,125

Int. Cl.[2] B62D *61/06*

U.S. Cl. 180—26 A **1 Claim**



1. An agricultural traction unit, comprising:

a frame,

a hitch attached to the frame,

a seat mounted on the frame,

a storage platform mounted on the frame,

a rail mounted on the storage platform,

a running board mounted on the frame, whereby a user can rest his feet while using the unit,

a driving mechanism attached to the frame, comprising:

a motor driving a sprocket,

a transmission connected to a sprocket, the transmission sprocket connected to the motor sprocket by a chain,

an output of the transmission connected to a sprocket driving a chain that drives a sprocket connected to an axle, a pair of front wheels driven by the axle, and

another output of the transmission connected to another sprocket driving another chain connected to a sprocket attached to a rear wheel, whereby the rear wheel may be driven

a steering mechanism, comprising:

a steering wheel,

a universal joint connected to each front wheel,

a spline connected to the universal joint

another universal joint connected to the spline and connected to the front axle and

means of rotating the front wheels in the horizontal plane driven from the steering wheel.

3,963,085

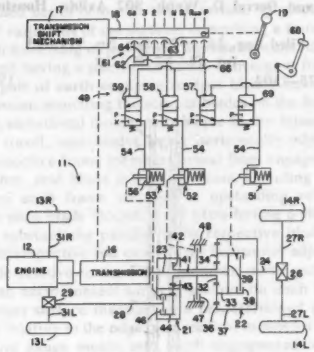
PLANETARY FOUR WHEEL DRIVE SYSTEM HAVING PLURAL MODES OF OPERATION

David S. Vinton, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 17, 1974, Ser. No. 515,482

Int. Cl.[2] B60K *17/30*

U.S. Cl. 180—44 R **10 Claims**



1. A drive transmitting system for a vehicle which has an engine and first and second sets of drive wheels spaced apart longitudinally along said vehicle, said first and second sets of drive wheels being driven through first and second drive shafts respectively, comprising a planetary gear set having a drive input member and first and second drive output members, means coupling said drive input member to said engine, means coupling said first output member to said first drive shaft, four wheel drive clutch means for selectively coupling said second output member to said second drive shaft, an overdrive brake means selectively engageable to immobilize said second output member whereby said first drive shaft may be selectively caused to rotate at a greater rate than said input member and, lock-up clutch means for selectively coupling said drive input member to said first drive shaft whereby differential action by said planetary gear set may be selectively eliminated and said first and second drive shafts are constrained to rotate at a predetermined rate relative to said input member and relative to each other.

3,963,086

TWIN-ENGINE OVERHUNG SCRAPER HAVING A LEADING ARM SUSPENSION

John B. Mason, Hudson, Ohio, assignor to General Motors Corporation, Detroit, Mich.

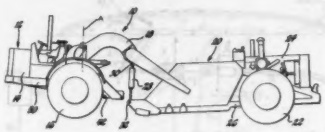
Filed May 20, 1974, Ser. No. 471,299

Int. Cl.[2] B60G *9/02;* **B60K** *17/32*

U.S. Cl. 180—51 **2 Claims**

1. An earthmoving scraper including an overhung tractor and a trailing scraper bowl respectively provided with a front transverse axle and a rear transverse axle each of which has rotatable wheels at the opposite ends thereof, power means carried by said tractor and said scraper bowl for driving the

wheels of the front and rear axles, the front axle being connected to the tractor by a suspension system for cushioning movement thereof and the rear axle being rigidly connected to the scraper bowl, said suspension system comprising a support arm having its front end rigidly secured to said front axle, pivot means connecting the rear end of said support arm to the tractor so as to permit said front axle to oscillate about



a transverse horizontal axis, spring means connected between said front axle and said tractor for cushioning movement of said front axle as the latter oscillates about said transverse horizontal axis, the center of said pivot means being located below a horizontal plane passing through the axis of rotation of the front axle wheels whereby said front axle moves upwardly relative to the tractor when the front wheels encounter a bump and the rear wheels of the scraper are being driven.

3,963,087

PROTECTIVE SCREENS FOR EXHAUST SYSTEMS OF MOTOR VEHICLES

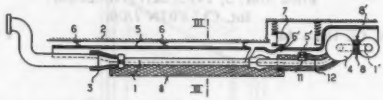
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Aug. 21, 1974, Ser. No. 499,294

Claims priority, application France, Aug. 22, 1973, 73.31001

Int. Cl.² B60K *13/04*

U.S. Cl. 180—64 A **7 Claims**



2. In a motor vehicle having

a vehicular body and

an exhaust system depending at least in part therefrom including

an exhaust duct for conducting high temperature gases and

a first protective screen, means for mounting said first protective screen in depending relation from said body and positioned in substantially spaced-apart relation between at least a portion of the exhaust duct and the ground, said screen comprising

a first layer in the form of a supporting metallic grid permeable to air flow, and

a second layer in the form of an open mesh metallic fabric in overlying relation to said first layer.

3,963,088

TRACTION CONTROL DEVICE

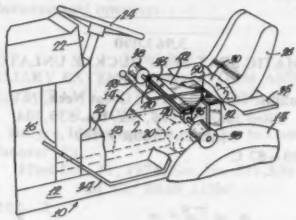
Ralph R. Gunderson, 8212 S. Homan, Chicago, Ill. 60652

Filed Aug. 7, 1975, Ser. No. 602,759

Int. Cl.² B60K *23/04*

U.S. Cl. 180—74 **5 Claims**

1. In a vehicle having a chassis with propelling wheels connected by a differential, a torque transfer device operable from an operator's station on the vehicle for connecting the propelling wheels directly to transfer torque from one wheel to the other when the differential permits relative rotation between the wheels, comprising: a torque transfer assembly including a rotatable shaft, friction elements fixed on the shaft and spaced apart axially to engage the propelling wheels of the vehicle, and bearing means positioned between the friction elements for rotatably supporting the shaft; support means of resiliently flexible material secured at one end to the chassis and connected remotely from said one end to said bearing means, flexure of the resilient support means permitting



movement of the friction elements of the assembly between an inoperative position spaced from the propelling wheels and an operative position in frictional engagement with the propelling wheels; and an actuating means positioned adjacent the operator's station and secured to the support means to flex the support means so as to afford movement of said friction elements between said inoperative and operative positions.

3,963,089

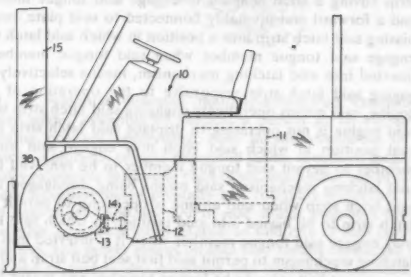
DIFFERENTIAL MOUNTING AND WHEEL DRIVE ARRANGEMENT

John T. Crawford, Lyndhurst, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed June 2, 1975, Ser. No. 583,029

Int. Cl.² B60K *17/16*

U.S. Cl. 180—75 **5 Claims**



1. A differential mounting and wheel drive arrangement comprising;

an axle beam having a pair of vertically spaced upper and lower plates, a pair of side plates individually secured to the ends of the upper and lower plates with each side plate having an aperture extending therethrough, and a vertically disposed plate secured to the forward edges of the upper and lower plates;

a pair of spindles individually secured to the outer surfaces of the side plates and having a horizontal axis extending therethrough;

a pair of wheel drive gears individually journaled on the spindles;

a differential disposed within the axle beam and secured to one of the plates; and

a pair of jackshafts extending outwardly from opposite sides of the differential and through said apertures in said side plates, each of said jackshafts having a gear formed on its distal end and mating with the wheel drive gear, said jackshafts and said apertures being radially offset from

said horizontal axis a predetermined distance as determined by the mating relation between the gears, and wherein said aperture is located in one of a plurality of positions which are disposed on a pair of diametrically opposite arcs of a circle having said horizontal axis as its center and said predetermined distance as its radius with one of said arcs being disposed forwardly of said horizontal axis.

3,963,090

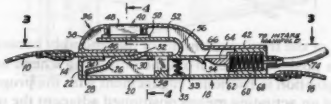
AUTOMATIC SEAT BELT BUCKLE UNLATCHING MECHANISM

Jesse R. Hollins, 40 Stoner Ave., Great Neck, N.Y. 11021

Filed Jan. 9, 1975, Ser. No. 539,704

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C **2 Claims**



1. An automatic seat belt buckle unlatching apparatus for a motor vehicle having an engine and a chassis, said apparatus comprising a first seat belt strap and a second seat belt strap, said first seat belt strap including a first end and a second end, said first end of said first seat belt strap adapted to be secured to said chassis, a tongue member secured to said second end of said first seat belt strap, said second seat belt strap including a first end and a second end with said first end adapted to be secured to said chassis, a seat belt latching mechanism secured to said second end of said second seat belt strap adapted to receive said tongue member, said latching mechanism including a plate secured to said second seat belt and a rigid latch strip having a latch adapted to engage said tongue member and a forward end pivotably connected to said plate, means biasing said latch strip into a position in which said latch may engage said tongue member when said tongue member is inserted into said latching mechanism, means selectively engaging said latch strip responsive to the operation of said engine, said means operatively engaging said latch strip when said engine is not operating to displace said latch strip from said position in which said latch may engage said tongue member to permit said tongue member to be removed from said latching mechanism, said means being disengaged from said latch strip when said engine is operating to permit said latch strip to be biased into said position in which said latch may engage said tongue member when it is inserted into said latching mechanism to permit said first seat belt strap and said second seat belt strap to be locked together and means independent of said selectively engaging means for manually releasing said tongue member while said motor vehicle engine is operating.

3,963,091

SPEED CONTROL DEVICES

John Noddings, and Norman Hunt, both of Leamington Spa, England, assignors to Associated Engineering Limited, England

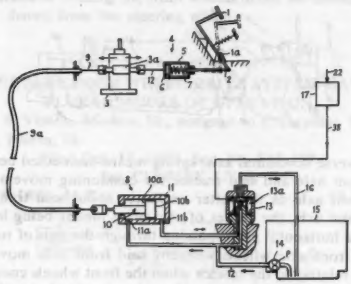
Filed Mar. 3, 1975, Ser. No. 554,513

Claims priority, application United Kingdom, Mar. 5, 1974, 9914/74

Int. Cl.² B60K *31/00*

U.S. Cl. 180—108 **17 Claims**

1. A system for enabling a vehicle to maintain a selected vehicle speed, which system comprises; an electrically-operable pressure control valve arranged to be fed with fluid from a source of fluid pressure; an electronic control circuit having a memory in which a selected vehicle speed can be set and which is arranged to supply a signal, representative of the difference between the actual and selected speeds, to the electrically-operable control valve; a differential area piston arrangement, to the smaller working area side of the differential piston of which the fluid source pressure is fed, and to the greater working area side of the differential piston of which



the output pressure of the control valve is supplied; and means coupled between the differential piston and the engine of the vehicle, the position of the piston being used to control the vehicle engine in order to maintain said selected vehicle speed.

3,963,092

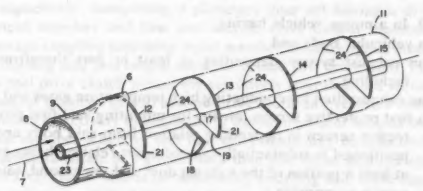
EXHAUST MUFFLER FOR COMPETITION CAR ENGINES

John M. Soares, 2495 American Ave., Hayward, Calif. 94545

Filed Mar. 5, 1975, Ser. No. 555,387

Int. Cl.² F01N *1/00*

U.S. Cl. 181—44 **1 Claim**



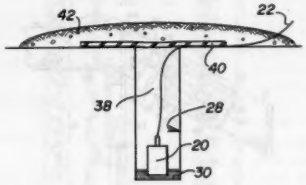
1. An exhaust muffler for competition car engines comprising a circular-cylindrical outer main shell having a predetermined diameter and extending along an axis, said main shell having an inlet at one end of a diameter no larger than said predetermined diameter and having an outlet at the other end of a diameter smaller than said predetermined diameter, a plurality of individual mutually disconnected helical discs forming spiral baffles disposed within said main shell and separated axially from each other, each of said spiral baffles having a pair of axially separated radial edges and having a central opening, means for securing said spiral baffles to said main shell with all of said edges in substantially the same axial plane and with all of said discs extending in substantially the same direction, and a circular-cylindrical tube open at both ends and extending from said inlet through said central openings in each of said spiral baffles in substantial contact with said baffles and to said outlet.

3,963,093

GEOPHONE NOISE REDUCTION METHOD

Harold B. Morris, Houston, Tex., assignor to Seismic Logs, Inc., Houston, Tex.

Filed Aug. 23, 1974, Ser. No. 499,912
Int. Cl.[2] G01V 1/16
U.S. Cl. 181—122 12 Claims



1. In seismic exploration, the method of sensing high frequency low noise seismic signals which comprises:

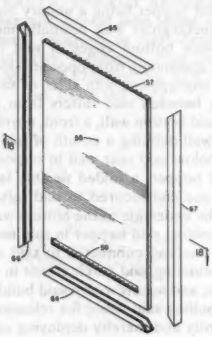
locating a detector in a shallow hole in an adherent base in the bottom of said hole with said detector spaced from the walls of the hole, and sealing the open end of said hole to provide a quiescent volume of air in said hole surrounding said detector.

3,963,094

MUFFLER STRUCTURES

Walter M. Nowikas, Morris Plaines, N.J., assignor to Donley, Miller & Nowikas, Inc., East Hanover, N.J.

Filed July 11, 1974, Ser. No. 487,571
Int. Cl.[2] E04B 1/99
U.S. Cl. 181—198 4 Claims



1. An enclosure for providing acoustic isolation from sounds within or without said enclosure formed from a plurality of muffler barriers joined together in contiguous air-tight relation, each said muffler barrier constructed to enclose a principal passage for the free flow of air therethrough in a direction substantially transverse to the principal direction of sound transmission without substantial reduction in the composite sound transmission loss through said enclosure,

at least one said muffler barrier comprising:

a pair of substantially parallel leaves disposed in spaced apart relation, each comprising a rigid backing,

the inwardly directed face of each of said leaves being lined with a layer of sound absorbing material impressed with a series of corrugations of saw-tooth cross-section longitudinally extended in a direction substantially parallel to a major edge of the said leaf, said leaves bonded together with the said corrugations in face-to-face relation at their apexes providing between them a series of longitudinal air channels comprising said principal air flow passage,

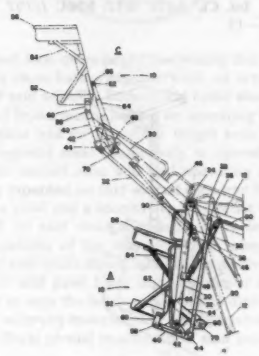
air intake and exhaust openings respectively disposed at corresponding opposite positions near the ends of each of said leaves in transverse relationship to said longitudinal air channels, whereby the air intake is at one end of one said leaf and the air exhaust is at the other end of the other said leaf, with the longitudinal air channels extending between said openings.

3,963,095

AUXILIARY EXTENSION PLATFORM ASSEMBLY SUPPORT FRAME DRIVE MEANS FOR AN AERIAL LADDER ASSEMBLY

Melvin R. Hedges, Littlestown, Pa., assignor to Cam Industries, Inc., Hanover, Pa.

Filed Dec. 11, 1974, Ser. No. 531,536
Int. Cl.[2] B66F 11/04
U.S. Cl. 182—2 3 Claims



1. A vehicular mounted multiply-articulated extensible aerial ladder assembly to support a person at an elevated working position comprising, base means attachable to a vehicle, a plurality of rigid elongated ladder members longitudinally extensible relative to each other, one end of one of said ladder members being pivotally and rotatably connected to said base means and another of said ladder members being extensible and retractable relative to said one of said ladder members, and power means on said base means connected to said one of said ladder members and operable to arcuately move the same angularly from a substantially horizontal inoperative position on said base means to an operative position at an obtuse angle to the horizontal position, an auxiliary extension platform assembly support frame comprised of an auxiliary extension ladder member and a plurality of spaced link means the same being respectively pivotally connected at one end thereof to the outer end of said another ladder member and movable between an initial position substantially perpendicular thereto to a position at an obtuse angle thereto, a platform assembly pivotally connected to the opposite end of said auxiliary extension ladder member and said link means the same being substantially equally spaced from and parallel to said auxiliary extension ladder member and mutually cooperative with said auxiliary extension ladder member to rigidly support and maintain said platform assembly substantially in the same relative plane in all positions of angular adjustment of said auxiliary extension platform assembly support frame and longitudinal extension and retraction of said another of said ladder members and upon vertically arcuate angular adjustment of said auxiliary extension platform assembly support frame, in combination with auxiliary extension platform

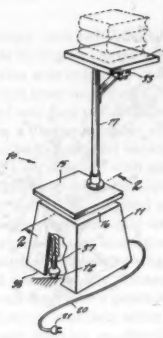
assembly support frame drive means comprised of a fluid operated cylinder unit extending between and connected at opposite ends thereof respectively to said auxiliary extension ladder member intermediately of its ends and the outer end portion of said another of said ladder members, said cylinder unit beng operable to move said auxiliary extension ladder member from a substantially vertically inoperative position to an operative position at an obtuse angle to said another of said ladder members, and further including a longitudinally extensible and contractable jack screw connected at opposite ends thereof respectively to the outer end portion of said auxiliary extension ladder member and the base of said platform, and operable to simultaneously maintain said platform substantially in said same relative plane through all positions of obtuse angular adjustment of said rigid elongated ladder members.

3,963,096

STEPPING STOOL WITH ELEVATING PLATFORM AND CONTROLS

Maude M. Jones, 9 Rosedale Ave., Montclair, N.J. 07042

Filed June 9, 1975, Ser. No. 585,073
Int. Cl.² A47C 9/12; E06C 1/397
U.S. Cl. 182—15 **1 Claim**



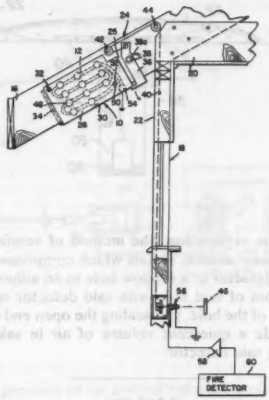
1. In a stepping stool, the combination of a hollow boxlike base mounted upon three casters, a top wall of said base having an opening therethrough, a mechanism inside said base protruding upwardly through said opening and having an elevating platform secured thereupon, a post mounted on said platform, a table panel mounted on an upper end of said post, and control means for operating said mechanism to raise or lower said platform, said mechanism including an electric motor attached to an extension cord and plug, a gear reducer driven by said motor driving a gear on an output shaft of said reducer, said gear driving a second gear having a threaded central opening engaged on a vertical screw shaft, said second gear being retained against vertical travel by stationary arms above and below said second gear, a keyway along said screw shaft engaging a stationary lug whereby said screw shaft moves vertically when said second gear is rotated, said keyway extending along a longitudinal central portion of said screw shaft, opposite ends of said screw shaft forming stops for said lug traveling in said keyway, said screw shaft being shorter than a height of said base, a lower end of said screw shaft clearing a floor when said platform is at a lowest elevation, said second gear and said lug engaging said screw shaft being within an upper portion of said hollow base, compression coil springs being fitted between said casters and said base, said casters extending lower than a lower rubber edge of said base when said springs are relaxed in extended positions, said control means comprising a two switch unit mounted on said table panel, said unit being in an electric circuit with said motor and a power source.

3,963,097

FIRE LADDER

Richard Fisher, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 26, 1975, Ser. No. 562,198
Int. Cl.² E06C 9/14
U.S. Cl. 182—76 **4 Claims**



1. In combination with a multiple story buildng having an overhanging roof including a plurality of spaced apart downwardly inclined projecting rafters, a stowed flexible escape ladder apparatus comprising: a hopper mounted extending across a pair of said rafters and pivoted to the rafters for selective downward rotation at a location above a window of said building; said hopper being a unitary body having a bottom generally rectangular wall normally inclined extending along and between bottom edges of said rafters, generally planar sidewalls upstanding from opposite sides of said bottom wall, in sliding engagement with sides of said rafters, a rear wall upstanding between said rafters from a rear, normally lower, edge of said bottom wall, a front, normally higher, edge of said bottom wall defining a mouth of said hopper which is adapted to lie below said rear wall in response to downward rotation of said hopper; a folded flexible ladder within said hopper having one end secured to said rafters; catch means biased against the underside of the bottom wall of said hooper for releasably holding said hopper in said normal inclination; a cable having one end connected to said catch means in a manner for articulating said catch means in response to pulling of said cable; and means within said building connected to said cable for pulling said cable for releasing said hopper to rotate downwardly and thereby deploying said ladder.

3,963,098

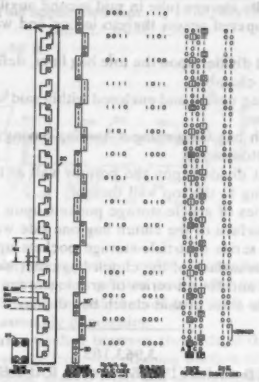
POSITION MEASUREMENT APPARATUS

Arthur M. Lewis, and Charles L. Winkler, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1974, Ser. No. 467,698
Int. Cl.² B66B 3/02
U.S. Cl. 187—29 R **25 Claims**

1. Position measurement apparatus for determining the position of a movable member along a travel path, comprising:
a plurality of indicia, said indicia defining the bits of a first digital code,
sensing means responsive to said indicia, said sensing means and said indicia being arranged for relative movement responsive to movement of the movable member,
said indicia defining a serial code which has a non-repeating bit pattern over any N consecutive bits thereof,

said sensing means providing signals indicative of N consecutive bits of the first digital code defined by said indicia, providing an unique combination of N signals each time the next bit of the code is sensed by said sensing means,



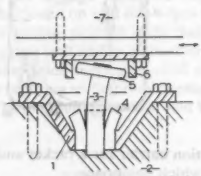
and translating means responsive to the signals provided by said sensing means, said translating means determining the position in the first digital code of the N consecutive bits indicated by the signals from said sensing means, and the location in the travel path where the indicia defines the N consecutive bits.

3,963,099

HYSTERETIC ENERGY ABSORBER

Robert Ivan Skinner, and Arnold John Heine, both of Wellington, New Zealand, assignors to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed May 8, 1975, Ser. No. 575,745
Int. Cl.² F16F 7/12
U.S. Cl. 188—1 C **10 Claims**



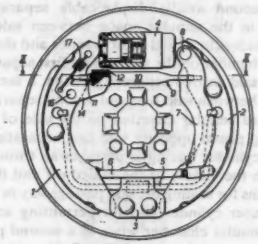
1. A cyclic energy absorber designed to be interposed between first and second members of a structure which are caused by in-coming energy to move to-and-fro relative to each other, said energy absorber comprising in combination: a thick anchor extending laterally and adapted to be connected rigidly to a first member of the structure; a main beam approximately perpendicular to the lateral extension of the anchor, rigidly connected at one peripheral plane to a first face of said anchor and projecting through a close-fitting hole in said anchor; loading means hingably connecting a second member of the structure to the main beam at a point remote from the connection to said anchor so that relative to-and-fro motion in a direction approximately normal to the beam between said first and second members of the structure causes said main beam to deform cyclically in flexure into the plastic range in a region close to said anchor, and separate from said first face.

3,963,100

INTERNAL SHOE DRUM

Manfred Kaub, Rhens, Germany, assignor to Girling Limited, Birmingham, England

Filed Feb. 26, 1975, Ser. No. 553,147
Claims priority, application United Kingdom, Feb. 27, 1974, 8987/74
Int. Cl.² F16D 65/56
U.S. Cl. 188—79.5 P **8 Claims**



1. An internal shoe drum brake comprising first and second opposed brake shoes having adjacent ends, an actuator engaging one pair of said adjacent ends of said brake shoes, mechanically operated brake means having an operating arm pivoted on said first shoe and an adjustable length strut having first and second opposed ends respectively in operative engagement with said second shoe and said operating arm, a pawl lever pivotally mounted on said second shoe and having a first arm carrying a pawl and a second arm, a ratchet wheel rotatably mounted on said strut and engaged by said pawl for effecting adjustment of the strut length to compensate for excess wear of said brake shoes, and biasing means biasing the second arm of said pawl lever into permanent engagement with said strut to urge the latter axially in the direction of said operating arm whereby movement of said second shoe relative to said strut effects pivotal movement of said pawl lever.

3,963,101

LENGTHWISE DISPLACEABLE, PRESSURE MEDIUM CHARGED, HYDRAULICALLY BLOCKABLE ADJUSTMENT ASSEMBLY

Ludwig Stadelmann, and Fritz Bauer, both of Altdorf, Germany, assignors to Suspa Federungstechnik Fritz Bauer & Sohne oHG, Altdorf, Germany

Filed July 30, 1975, Ser. No. 600,524
Int. Cl.² F16F 9/32
U.S. Cl. 188—300 **13 Claims**

1. A lengthwise-adjustable, pressure-medium charged, hydraulically blockable adjustment assembly comprising:

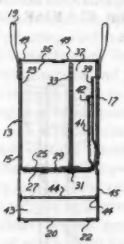
an outer cylinder;
an inner cylinder fitting coaxially within said outer cylinder and having a sealed off face at one end thereof, said sealed off face exposed to the outside;
a piston displaceably mounted within said inside cylinder, said piston separating in a sealing, fluid-tight manner, said inside chamber into first and second housing chambers;
a piston rod connected to said piston and extending sealingly outside of said cylinders at the end opposite said sealed off face;
first and second axially displaceable separating pistons disposed in the annular space between said outer and inner cylinders in a fluid-tight manner and defining a first annular chamber on the side of said first separating piston opposite said second separating piston, a second annular chamber between said first and second separating pistons and a third annular chamber on the side of said second separating piston opposite said first separating piston;
said inner cylinder having a passageway through the wall thereof in the vicinty of the sealed off end thereof;
sealing means for sealing off said passageway in one position of said inner cylinder and for permitting access to said second annular chamber when in a second position;
connecting means for permitting fluid access from said housing chamber on the side of said piston which is connected to said piston rod to at least a portion of said first annular chamber;
pressure means within said second annular chamber for urging said first and second separating pistons apart; and
substantially non-compressible fluid filling said first and second housing chambers and said first and third annular chambers;
whereby said inner cylinder may be axially displaced between a locking position at which said sealing means seals off said passageway and said piston is locked and a releasing position at which said sealing means permits access of said passageway to said second annular chamber and said piston may move.

3,963,102

COMBINATION CARRY-ON LUGGAGE BAG WITH TOTE BAG AND CLUTCH BAG

Bess Carp, Detroit, Mich., assignor to Joseph Carp, Detroit, Mich., a part interest

Filed June 17, 1974, Ser. No. 479,783
Int. Cl.[2] A45C *3/00*, *13/30*
U.S. Cl. 190—51 **11 Claims**



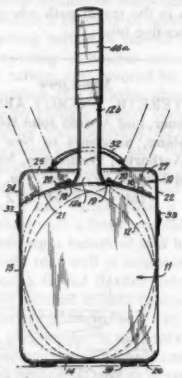
1. A carry-on luggage bag comprising a housing having side, end, bottom and top walls;
a liner spanning the side walls with its bottom wall spaced above said bottom wall, defining a first auxiliary storage chamber with a lateral zippered access thereto in one side wall;
an upright divider upon said liner defining a first storage chamber on one side thereof;
a tote bag nested and enclosed in said first storage chamber;
said tote bag including a housing having side, end, top and bottom walls;
an elongated liner mounted on and spanning the latter side walls and spaced above the tote bag bottom wall, defining a second auxiliary chamber with a lateral zippered access thereto in one side wall;
an umbrella storage tube in said second auxiliary chamber, with zippered access thereto in one end wall of the tote bag;
an upright divider upon the tote bag liner, defining a second storage chamber;
a clutch bag nested and enclosed within said second storage chamber;
said clutch bag comprising a housing having side, end, top and bottom walls;
an upright divider upon the bottom wall of the clutch bag extending to the top wall thereof;
a first series of article-storage pockets upon and along the inner surface of the clutch bag one side wall;
a second series of article-storage pockets upon and along the innersurface of the clutch bag other side wall;
and third and fourth series of article-storage pockets upon opposite sides of said clutch bag divider.

3,963,103

COMBINED CARRYING BAG AND RACKET CARRIER

Arthur T. Cowen, III, 20 W. 75th St., New York, N.Y. 10023

Filed Jan. 8, 1975, Ser. No. 539,332
Int. Cl.[2] A45C *3/00*
U.S. Cl. 190—52 **4 Claims**



1. A combination carrier for a racket and associated clothing equipment, which comprises
a. a clothing case,
b. a rectangular racket case secured to and extending from one side of said clothing case.
c. said racket case being substantially in the form of an open top pocket having width dimensions generally corresponding to the width of a racket head to be carried therein, and having a height dimension sufficient to accommodate the racket at least up to its throat area said pocket having a top opening side arranged in the form of an arc whose center of radius is near the bottom of the pocket,
d. closure means for said open top side of said racket case to engage and support both sides of said throat area of the racket,
e. said closure means being adjustable along substantially the entire length of said top open side to provide, upon closure, support for the racket to hold it in any one of various angular orientations, and
f. means for carrying said carrier in an upright position.

3,963,104

HANDLE AND MEANS FOR SECURING SAME TO A PIECE OF LUGGAGE

Leon Lautin, 43 White Drive North, Cedarhurst, N.Y. 11516

Continuation of Ser. No. 465,601, April 30, 1974, abandoned, which is a continuation of Ser. No. 233,900, March 13, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 565,800

Int. Cl.² A45C *13/22*

U.S. Cl. 190—58 R 1 Claim

1. An assembly for securing a molded plastic handle including an elongated gripping portion and a side post extending downwardly from each end thereof to a wall of a piece of luggage, said assembly comprising:

a. a rigid bar extending between the ends of the side posts that are remote from the gripping portion of the handle, said bar being spaced from and substantially parallel to the handle gripping portion, said bar including two axially spaced apart undercuts encircling said bar and two axially spaced apart transverse interfaces intermediate the said posts and outwardly spaced from said undercuts along said posts;

b. an elongated metallic strap mounted on said bar, said strap having two integral, deformable tabs spaced inwardly from the ends thereof for engaging said undercuts on said bar and two internally directed ribs spaced inwardly from the ends of said strap and positioned so as to engage said transverse interfaces on said bar to thereby limit axial movement of said strap relative to said bar, said strap including a pair of longitudinally extending, spacedly parallel side edges having a length dimension greater than the axial spacing between said interfaces for concealing said undercuts and said transverse interfaces; and

c. a plurality of deformable finger means integral with and spaced along each said side edge of said strap for securing said strap to the luggage wall, said finger means being alternately positioned on said side edges of said strap, said finger means having pointed ends that are adapted to pierce the luggage wall and to be bent towards each other and against the inside surface thereof, said finger means being sufficiently long so that they overlap each other and extend past the longitudinal axis of said bar after they are bent.

3,963,105

BEARING AND CLUTCH DIAPHRAGM ASSEMBLY

Horst Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

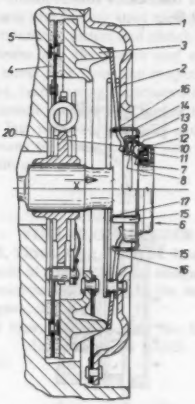
Filed May 23, 1974, Ser. No. 472,861

Claims priority, application Germany, May 26, 1973, 2327023

Int. Cl.² F16D *23/14*

U.S. Cl. 192—98 6 Claims

1. A clutch release bearing for attachment with a friction clutch having an annular spring release member in which a plurality of slots forming radially inwardly directed arms define a central bore, said clutch release bearing comprising an inner race member and and outer race member, both said race members being made of sheet metal and being arranged concentrically to one another, a plurality of rolling bodies being located between said race members, said inner race member being folded to have a Z-shaped cross section and being formed with an annular shoulder integral therewith and having a plurality of fingers uniformly distributed about its free end



and being folded to extend substantially axially away from said rolling bodies and being adapted to project through the slots of said spring release member into engagement therewith.

3,963,106

CLUTCH DISENGAGER WITH SLIDING SLEEVE

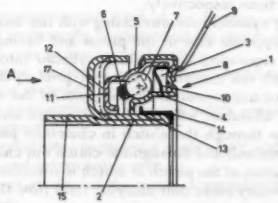
Horst Manfred Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Plettenburgerweg, Jutphaas, Netherlands

Filed Dec. 6, 1974, Ser. No. 530,310

Claims priority, application Germany, Dec. 21, 1973, 7345381[U]

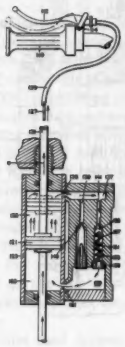
Int. Cl.² F16D *19/00*

U.S. Cl. 192—98 8 Claims



1. A clutch disengager comprising a sliding sleeve having a radially extending flange, and an antifriction bearing arranged for radial movement thereon, said bearing including a rotating race and a nonrotating race, said nonrotating bearing race adapted to rest against said radial flange of said sliding sleeve, said sliding sleeve including a bore hole, said sliding sleeve being a single part formed by noncutting methods from sheet metal and having a cuff in the region of said bore hole, said cuff resulting in a radial outer wall part forming, on said sleeve, a continuous double wall over a part of said sleeve length, said radial outer wall part of said cuff passing into said radially extending flange for support of said nonrotating bearing race.

3,963,107
MOTORCYCLE CLUTCH WITH DASPOT
Joseph E. Bolger, Summer St., Barre, Mass. 01005
Filed Dec. 12, 1974, Ser. No. 531,909
Int. Cl.² F16D 57/00
U.S. Cl. 192—109 D 1 Claim



1. In a clutch assembly of a motorcycle including driving and driven clutch members and cooperant means for effecting the release of the driving engagement between the clutch members inclusive of a handlebar-mounted and operator-operated clutch lever and a clutch cable connecting between the clutch lever and the distant clutch assembly,

the improvement in a clutch control assemblage located between and operative with the clutch cable and the clutch assembly and rendered operative upon any sudden clutch cable rupture for effecting an adequate and measured degree of clutch engagement for enabling the operator to bring his vehicle under renewed operational control comprising:

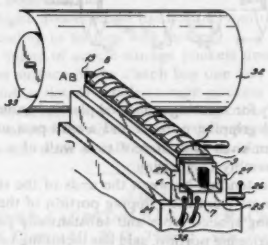
a main cylinder,

a piston connected to the clutch cable and being reciprocable within the main cylinder and dividing the main cylinder into variable clutch in and clutch out chambers as the piston is reciprocated alternately in clutch in and clutch out directions respectively,

an auxiliary cylinder communicating with the main cylinder at each opposite side of the piston and having a ported wall for separating the auxiliary cylinder into clutch in and clutch out chambers, adjacent primary and secondary valve units mounted in the ports of the wall of the auxiliary chamber, with the primary valve unit allowing fluid flow through the clutch in chambers past the primary valve unit and through the clutch out chambers for the actuation of the piston in clutch in direction and with the secondary valve unit allowing fluid flow through the clutch out chambers past the secondary valve unit and through the clutch in chambers for the actuation of the piston in clutch out direction.

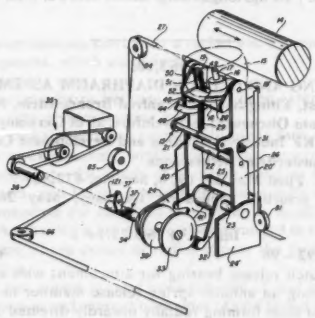
3,963,108
MATRIX PRINTING HEAD
Fritz Steinhausser, Sommerda, Germany, assignor to VEB Kombinat Zentronik Sommerda/TH, Sommerda, Germany
Filed May 20, 1974, Ser. No. 471,263
Claims priority, application Germany, July 2, 1973, 171980
Int. Cl.² B41J 3/50
U.S. Cl. 197—1 R 2 Claims

1. A printing head comprising a plurality of flat, straight printing elements of equal length, a plurality of pot-shaped electromagnetic driving elements, each printing element being connected with a different one of said driving elements to be driven in a printing direction upon activation of that driving element to which it is connected, said driving elements being aligned and each having a central opening registering with the central openings of the others of said plurality of driving elements, and each printing element extending through the central opening of each driving element, a carrier supporting said plurality of driving elements and having a front piece and a rear piece, said front and rear pieces each having an opening registering with said central openings of said driving elements, each of said printing elements extending into said openings of said front and rear pieces, spring elements disposed in the openings of the front and rear pieces and engaging and guiding



said plurality of printing elements, each driving element comprising a body, coil means, electrical connector means projecting from the body, a tubular armature, a connector element movable with the armature, return spring means associated with said armature, each said connector element constituting means connecting an associated printing element with said driving element, pedestal means comprising a pair of clamping elements disposed on opposite sides of the carrier movable toward each other to clamp an assembly of carrier, driving elements and printing elements therebetween, said clamping elements constituting heat sink means, said pedestal including electrical contact means for cooperation with said electrical connector means of said driving elements.

3,963,109
SINGLE ELEMENT TYPEHEAD POSITIONING MECHANISM
William J. Smith, West Hartford, Conn., assignor to Royal Business Machines, Inc., Hartford, Conn.
Filed June 9, 1975, Ser. No. 585,051
Int. Cl.² G41J 1/32
U.S. Cl. 197—55 10 Claims



1. In a machine having a positionable type element and translator mechanism for positioning said type element to any of a plurality of selected coordinate positions in response to coded input signals,

means biasing said type element to a zero coordinate position,

a rotatably indexable member,

a plurality of pins mounted on said rotatably indexable member at locations spaced from the axis of rotation thereof and movable from unset to set positions in an axial direction,

at least one band anchored at one end and connected at its other end to said type element, said band being located in the path of movement of for displacement by set pins on and incident to indexing of said rotatably indexable member,

means for setting pins in response to input code signals,

and means responsive to a printing cycle initiating signal for indexing said rotatably indexible member through 90° whereby set pins will displace said band to position said type element to a selected position incident to indexing movement of said rotatably indexable member.

3,963,110

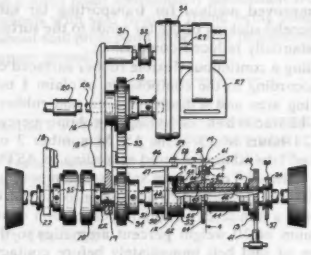
STORAGE MAGAZINE AND SHEET FEEDER FOR TYPING APPARATUS

Francis P. Hyland, Wauwatosa; Phillip J. Tollefson, Milwaukee; Harlan J. Pilon, Waukesha, and Hugo E. Borchert, Milwaukee, all of Wis., assignors to Hy Grip Products Co., West Allis, Wis.

Filed June 26, 1974, Ser. No. 483,403

Int. Cl.² B41J *13/02, 13/10*

U.S. Cl. 197—130 **8 Claims**



1. An automatic sheet feeding apparatus, an automated typing apparatus having a platen, a sheet supply magazine means for storing a plurality of sheet units with an outer exposed sheet unit and having mounting means for mounting the magazine means in overlying relationship to said platen, said magazine means having a lower opening allowing sequential transfer of said sheet units to said platen, said platen mounted on a rotating shaft for successively moving of each of said sheet units through the typing apparatus, a rotating indexing means connected to said platen for sequential moving of each of said sheet units through the typing apparatus in predetermined spaced lines, a feed roller means rotatably mounted to selectively engage said outer sheet unit in the magazine means and moving said outer sheet unit into the platen, an electrical motor, means coupling said motor to said feed roller means and to said platen to provide precise corresponding movement of the platen with the feed roller means, clutch means interposed between the platen and the indexing means of the typing apparatus for coupling and decoupling said platen and indexing means, drive circuit means for energizing the clutch means and motor in timed relation, said clutch means decoupling the indexing means from the platen during the operation of the motor, and encoding means for monitoring the movement of each of said sheet units through the typing apparatus and coupled to the indexing means and rotated in synchronism with the indexing means, said encoding means establishing an output in accordance with the rotation of the indexing means, comparator means having a presettable input means for presetting of the comparator means and being connected to the output of said encoding means and establishing a null signal in response to a selected comparison between said output and said preset input means, and said drive circuit means for said motor and said clutch means connected to the output of the comparator means and having start means responsive to said null signal to activate the motor and clutch means to rotate the feeder roller means and the platen and automatically introduce the outer sheet unit from the magazine means into the typing apparatus, reset means responsive to the null signal to reset the comparator means, stop means to sense the proper location of the last named sheet unit and connected in the drive circuit means to terminate the operation of the motor and the clutch means.

3,963,111

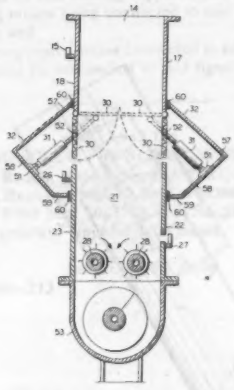
FULL FLOW FEEDER

Edsel A. Harrell, Tifton, Ga.; Zolon M. Looney, and Oliver L. McCaskill, both of Leland, Miss., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 12, 1975, Ser. No. 557,844

Int. Cl.² B65G *43/08*

U.S. Cl. 198—37 **7 Claims**



1. An apparatus and method for feeding cotton continuously and uniformally to individual gin stands in a battery of gin stands comprising in combination.

a. an upper section of a rectangular chamber for receiving process material comprising:

1. an open ended top through which process material is received,

2. parallel sides forming an angle of 90° with the horizontal and interrelating with,

b. a lower section of the same rectangular chamber comprising:

1. an open bottom for material discharge,

2. parallel sides which are vertical extensions of the upper rectangular chamber and

3. two parallel movable valves, pivotably mounted on hinges at the top and located on the two chamber sides with the longer dimension, said valves running substantially the full length of said sides and forming part of the chamber sides when in the open position and forming a bottom for the upper section of the rectangular chamber and concurrently a top for the lower section of the rectangular chamber when in the closed position, substantially forming a single chamber in the open position and two separate chambers in the closed position, thus imposing a positive means of controlling the flow of process materials, and

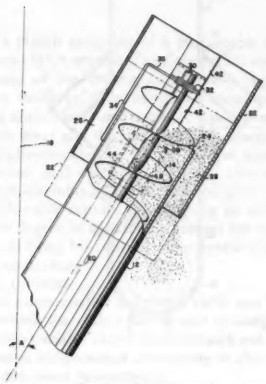
a. a means of opening and closing said valves,
b. a means of energizing the opening and closing mechanism,
c. a means of supporting the valves and the opening and closing means.
4. a means of automatically controlling the level of process materials in the chamber,
5. a means of feeding process material from the chamber at a variable and adjustable rate which is determined by the capacity of the ginning system, and
a. a means of applying power to the said variable and adjustable feeding means.

3,963,112

WINDGUARD FOR GRAIN DISTRIBUTOR

John B. Crego, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 14, 1975, Ser. No. 558,508
Int. Cl.² B65G *47/44*
U.S. Cl. 198—72 **7 Claims**



1. Grain distributing means for discharge into a receptacle comprising a grain tube adapted to be mounted in an upstanding manner within or adjacent a receptacle to receive grain from said tube, an auger mounted rotatably within said tube and adapted to conduct grain from the lower end of the tube to the upper end thereof, a windguard mounted upon the upper end of said tube and comprising a wall surrounding the upper end of said tube in radially spaced relation thereto to provide a circumferential discharge space between the upper end of said tube and said wall to receive grain discharged from the upper end of said tube and permit the same to fall by gravity downwardly through said discharge space and exit therefrom at the lower end of said wall, said wall being of limited length adequate to extend beyond the upper end of said tube and at lease a short distance below the upper end of said tube, whereby said wall serves to prevent wind from blowing against grain discharging from the upper end of said tube, and means on the upper end of said tube adjustably engaging said surrounding wall for movement in an axial direction relative to said upper discharge end of said tube, thereby to adapt said discharge means to operate effectively during different grain discharge rates and wind conditions.

3,963,113

CONVEYOR BELTS FOR TRANSPORTING TAR SANDS

Jackson S. Boyer, Wilmington, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 509,205, Sept. 25, 1974. This application Aug. 20, 1975, Ser. No. 606,150
Int. Cl.² B65G *15/30*
U.S. Cl. 198—193 **4 Claims**

1. A flexible conveyor belt particularly suited for use in transporting tar sands and having limited resistance to swelling when exposed to liquid hydrocarbons containing up to 30 weight percent aromatics said conveyor comprising a rubber belt having a plurality of metal cables longitudinally disposed in said belt and arranged substantially parallel to each other said belt having a rubber surface comprising a vulcanized mixture of:
a. 100 parts by weight of a rubber mixture containing 20 to 95 weight percent nitrile rubber and 80 to 5 weight percent of a second rubber selected from the group consisting of natural rubber, neoprene, polybutadiene, styrene-butadiene copolymer and polyisoprene said rubber mixture having an acrylonitrile content in the range of 5 to 35 weight percent,
b. 1 to 30 parts by weight of a liquid plasticizing agent compatible with said rubber mixture and
c. 30 to 60 parts of a reinforcing agent selected from hard clay and hydrated silica carbon black, said vulcanized mixture characterized as having a volume percent swell after 24 hours at 158°F in ASTM number 3 oil in the range of 1 to 40 as measured according to ASTM D-471 and a Gehman T_{100} stiffness value at a temperature in the range of −30°F to −100°F as measured according to ASTM D-1053.

3. An improved method for transporting tar sands in a manner whereby sticking of the tar sands to the surface of the belt is substantially reduced comprising:
a. providing a continuous flexible rubber surfaced conveyor belt according to the composition of claim **1** between a receiving area and a discharge area said rubber surface being characterized as having a volume percent swell after 24 hours at 158°F in ASTM number 3 oil in the range of 1 to 40 as measured according to ASTM D-471 and a Gehman T_{100} stiffness value at a temperature in the range of −30°F to −100°F according to ASTM D-1053,
b. applying a thin layer of liquid hydrocarbon containing a maximum of 30 weight percent aromatics to the upper surface of said belt immediately before contacting said surface with the tar sands to be transported and thereafter,
c. transporting tar sands on the surface of said belt from a receiving area to a discharge area.

3,963,114

CONVEYOR BELT DRIVE ASSEMBLY

Joseph J. Younger, Paintsville, Ky., assignor to Continental Conveyor and Equipment Company, Winfield, Ala.

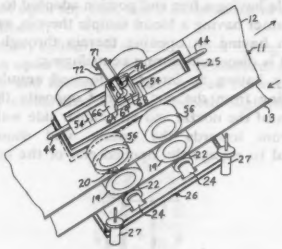
Filed May 12, 1975, Ser. No. 576,791
Int. Cl.² B65G *23/00*
U.S. Cl. 198—203 **19 Claims**

1. Apparatus for driving an endless conveyor belt having upper and lower strands with marginal drive edges thereon,
a. a supporting frame extending transversely of said belt,
b. a pair of drive axles mounted in said supporting frame and spaced from each other in the direction of travel of said belt and extending transversely of the direction of travel of said belt,
c. drive wheels carried by each said drive axle for driving engagement with the under surfaces of the marginal drive edges of the upper strand of said belt and for driving engagement with the upper surfaces of the marginal drive edges of the lower strand of said belt,
d. at least one rotatable support member mounted beneath said lower strand of said belt in position to engage the under surfaces of the marginal drive edges of the lower strand of said belt opposite said drive wheels so that said

lower strand is pinched between said rotatable support member and said drive wheels and is driven thereby,

e. a floating frame operatively connected to said supporting frame and adapted for movement relative thereto,

f. upper axles carried by said floating frame and spaced from each other in the direction of travel of said belt and extending transversely of the direction of travel of said belt,



g. upper wheels carried by said upper axles in position to engage the upper surfaces of the marginal drive edges of the upper strand of said belt opposite said drive wheels so that said upper strand is pinched between said upper wheels and said drive wheels and is driven thereby, and

h. means to apply downward pressure to said floating frame at a pivot point substantially equidistant from said upper wheels with said floating frame being adapted to swivel about said pivot point to selected positions relative to said upper strand.

3,963,115

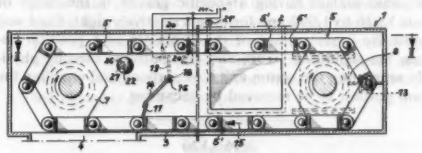
APPARATUS FOR MONITORING THE OPERATION OF A DRAG CHAIN CONVEYOR

Fritz Teske, Industriestrasse 28, and Lothar Teske, Industriestrasse 30, both of Porz-Westhoven, Germany

Filed Oct. 9, 1974, Ser. No. 513,502

Int. Cl.² B65G 15/30

U.S. Cl. 198—208 **12 Claims**



1. In a drag chain conveyor including a trough; an endless conveyor chain disposed in the trough and trained about a drive sprocket and a return sprocket for being supported with a slack and at a height of predetermined magnitude; means for driving the drive sprocket; a rotary shaft on which the return sprocket is mounted; bearing means for the return sprocket; two bearing supports on each end of the rotary shaft; the bearing supports being displaceable along the direction of conveyance; means exerting a force on the bearing supports in a direction oriented away from the drive sprocket for tensioning the conveyor chain with a bias of predetermined magnitude, the improvement comprising a monitoring apparatus including in combination

a. a first and a second cylinder, each having an inner space;

b. a separate piston slidably arranged in each cylinder and dividing the inner space of each cylinder into a first and a second cylinder chamber;

c. a first conduit maintaining communication between said first cylinder chambers of said first and second cylinders for transferring pressure medium between said first cylinder chambers of said first and second cylinders during displacement of either piston in its respective cylinder;

d. a second conduit maintaining communication between said second cylinder chambers of said first and second cylinders for transferring pressure medium between said second cylinder chambers of said first and second cylinders during displacement of either piston in its respective cylinder;

e. a signal transmitter means for emitting a signal;

f. a first piston rod affixed to the piston disposed in said first cylinder and passing through said first cylinder chamber of said first cylinder, said first piston rod being connected to the one of said bearing supports for displacing said piston in said first cylinder in response to a change in the position of said one bearing support;

g. a second piston rod affixed to the piston disposed in said second cylinder and passing through said first cylinder chamber of said second cylinder, said second piston rod being connected to the other of said bearing supports for displacing said piston in said second cylinder in response to a change in the position of said other bearing support;

h. separate dynamic pressure sensing means connected to each conduit for responding solely to dynamic pressures generated in said conduits by a sudden change in the position of said bearing supports, said dynamic pressure sensing means being connected to said signal transmitter means; and

i. signal-responsive means connected to said signal transmitter means for responding to said signal.

3,963,116

FEEDING SCREW FOR SLIDE CASTING MACHINE

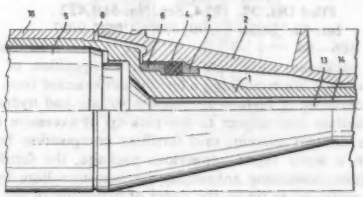
Veli Matti Rautia, Kalamiehentie 8 C 21, and Erkki Kalevi Asplund, Haukanmaki E 32, both of 04300 Hyryla, Finland

Filed June 10, 1975, Ser. No. 585,658

Claims priority, application Finland, June 25, 1974, 1945/74

Int. Cl.² B65G 33/00

U.S. Cl. 198—213 **11 Claims**



1. A feeding screw for a slide casting machine. comprising:

a non-rotary, tubular inner part with a widened outer end;

a screw part arranged to rotate coaxially around the inner part;

a vibrator arranged at the widened outer end of the inner part;

power transmission means for the vibrator, arranged inside the tubular inner part;

a reslient means arranged in an annular space between the inner part and the screw part; and

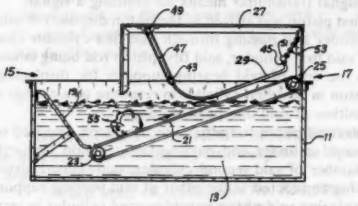
tightening means with which the mutual axial position of the inner part and the screw part can be changed in order to change the resiliency of the resilient means.

3,963,117

ARTICLE BRAKE FOR INCLINED CONVEYOR

Joseph A. Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 350,297
Int. Cl.² B65G *47/00*
U.S. Cl. 198—227 **3 Claims**



1. An article roll back brake for an inclined conveyor comprising, in combination,

an array of elongate parallel spaced apart downwardly convexed longitudinal elements disposed longitudinally in the direction of movement of the inclined conveyor,

a brake frame arranged and disposed to support said array at a preselected distance above the inclined conveyor,

a pivot arm having one end pivotally connected to said brake frame and another end pivotally connected to said array, and

stop means disposed to arrest the downward pivotal movement of the other end of said array at a preselected point out of impingement on the conveyor,

whereby dual pivotal movement of said array occurs at the end of said array opposite the end at which said stop means is disposed.

3,963,118

FERTILIZER COMPOSITION CONTAINING FERROUS SALT

Fred Eugene Ferguson, Marysville, Ohio, assignor to O. M. Scott & Sons Company, Marysville, Ohio

Filed Oct. 31, 1974, Ser. No. 519,422
Int. Cl.² B65D *81/00*, *5/00*; C05C *9/00*
U.S. Cl. 206—84 **10 Claims**

8. A packaged particulate fertilizer composition of enhanced storage life containing a ferrous salt selected from the group consisting of ferrous ammonium sulfate and hydrated ferrous sulfate and subject to the pick-up of excessive free moisture content therein, said fertilizer composition being sealed in a water vapor impervious package, the fertilizer composition containing anhydrous magnesium sulfate in an amount sufficient to tie up the water of hydration of the ferrous salt.

3,963,119

SERUM SEPARATING APPARATUS

Michel J. Lukacs, Goshen, and Ian H. Jacoby, Middletown, both of N.Y., assignors to Lucaks and Jacoby Associates, Middletown, N.Y.

Continuation of Ser. No. 411,287, Oct. 13, 1973, abandoned, which is a division of Ser. No. 270,278, July 10, 1972, Pat. No. 3,780,935. This application Sept. 16, 1974, Ser. No. 505,992
Int. Cl.² B01D *21/26*
U.S. Cl. 206—216 **11 Claims**

1. A dispensing device for holding and dispensing a supply of a sealant used as a separator between serum and clot portions of a blood sample obtained during centrifuging of the sample in an open ended container, said device including:

a hollow body portion holding a supply of sealant therein;

said sealant comprising a supply of thixotropic, water insoluble, substantially non-toxic material consisting essentially of a silicone fluid and an inert filler dispersed therein, said sealant having a specific gravity in the range of 1.026 to 1.092;

said hollow body portion including an integrally formed elongated narrow nozzle portion extending therefrom and containing a portion of the sealant material;

said nozzle having a free end portion adapted to extend into a container having a blood sample therein, said free end portion having an opening therein through which the sealant is dispensed during centrifuging;

said body having an integrally formed annular shoulder extending from the end thereof opposite the free end portion of the nozzle and an annular side wall extending therefrom towards the nozzle, said shoulder being adapted to engage the opened end of the container for

supporting the device in said container, with the side wall of the device received within the container for stabilizing the device therein during centrifuging, whereby upon centrifuging of the blood sample in the container with said device mounted therein, said sealant will separate the blood into serum and clot portions and form a separator between said serum and clot portions of the centrifuged sample.

11. A seal for physically separating the serum and clot portions of a blood sample in a container; said seal comprising a layer of thixotropic water insoluble material substantially chemically inert with respect to the constituents of the serum portion of the blood and comprising a silicone fluid and a filler, said sealant having a specific gravity in the range of about 1.026 to 1.092 and forming a relatively tight, fixed seal against the inner surface of the container at a position between the separated serum and clot portions thereby physically separating the serum and clot portions and enabling the serum portion to be removed by decanting.

3,963,120

CONTAINER FOR DENTAL MATERIALS AND THE LIKE

Alan J. Perfect, Allentown, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 7, 1975, Ser. No. 548,119
Int. Cl.² B65D *51/16*, *51/18*; 220
208;253;256;288;20.5;366–367;377;DIG. 27
U.S. Cl. 206—219 **11 Claims**

1. A container for prepackaging materials which must be kept separate until just prior to use comprising:

a. a generally cylindrical first portion having an open top end and a closed bottom end defining a chamber;

b. a generally cylindrical second portion having an open top end, an open bottom end, an inner surface and valve means intermediate said ends, said second portion having its bottom end secured to the top end of said first portion;

c. a third portion having a chamber therein and one end rotatably connected with the top end of said second portion, said third portion having valve closing means whereby said valve means on said second portion may be temporarily closed and the chambers in said first portion

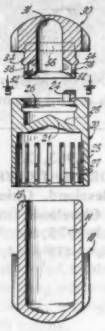
and said third portion temporarily separated from one another;

d. air venting means whereby air may be vented from the chamber in said first portion during assembly of said capsule to prevent accidental disassembly thereof due to heating and consequent expansion of said air.

5. A container for prepackaging materials which must be kept separate until just prior to use comprising;

a. a generally cylindrical first portion having an outer surface, an open top end, and a closed bottom end defining a chamber;

b. a generally cylindrical second portion having an open top end, an open bottom end, an inner surface, and an outer surface and having a barrier spaced between said ends with a constricted opening therethrough adjacent said



inner surface, said barrier having a top surface, and said second portion having its bottom end secured to the top end of said first portion; and

c. a third portion having an axially positioned chamber therein and one end having sliding means adapted to engage the top surface of said barrier in said second portion and close said opening and means for rotatably connecting said one end with the top end of second portion, said third portion also having a conduit extending from said chamber through said sliding means so that rotation of said third portion with respect to said second portion causes said conduit of said third portion to be aligned with said opening in the barrier of said second portion to connect said chamber in said third portion with the chamber in said first portion.

3,963,121

CARRIER CARTON WITH DISPLAY PANEL

Michael A. Kipp, Phoenixville, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed July 21, 1975, Ser. No. 597,313
Int. Cl.² B65D *5/02, 75/00*
U.S. Cl. 206—434 **1 Claim**

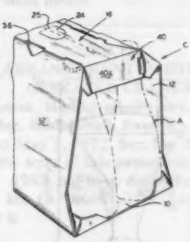
1. In an open ended, sleeve type carrier carton formed from foldable paperboard for holding a plurality of articles arranged in at least one row, the combination of:

a. an opposed pair of top and bottom walls and an opposed pair of side walls foldably joined to each other to form a tubular structure open at the ends thereof;

b. at least one relatively narrow, elongated, advertising display panel foldably connected at its upper edge to an edge of said top wall and disposed to extend outwardly and downwardly therefrom;

c. a pair of gusset panels having certain corresponding side edges foldably connected to opposite side edges of said display panel and having other corresponding edges foldably connected to adjacent edges of respective side walls;

d. said gusset panels being connected to said display panel and said side walls on angularly related fold lines, so that when the carton is in an erected condition, said gusset panels will extend inside of their related side walls and urge said display panel inwardly of said carton tubular structure to a generally vertical position;



e. at least one of said gusset panels having a retaining tab engageable with said display panel to retain it in a generally vertical position;

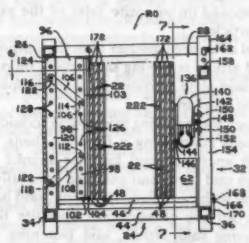
f. said tab extending outwardly from an edge of said gusset panel immediately adjacent said display panel and being spaced from a side wall, to which said gusset panel is connected, by said gusset panel.

3,963,122

FRONT RESTRAINT DEVICE FOR SHIPPING BINS

Walter E. Pater, New Kensington, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 15, 1974, Ser. No. 488,851
Int. Cl.² B65D *85/48*
U.S. Cl. 206—448 **10 Claims**



1. In a bin for shipping loose sheets, wherein the bin is of the type having a back support secured to a base for supporting each of the sheets on an edge in a generally vertical position in facing relationship to one another, the improvement comprising:

an inflatable member having an engaging surface;

means mounting said inflatable member for securing said inflatable member in spaced relation to the back support and the base with the engaging surface of said member facing the back support; and

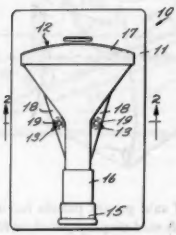
valve means for inflating said inflatable member to move the engaging surface of said member toward the back support wherein the engaging surface engages a one of the plurality of sheets to be shipped farthermost from the back support to urge the sheets to be shipped toward each other against the back support such that the sheets during shipment respond to oscillatory and lateral forces as a unitized pack and said member dampens oscillatory and lateral forces acting on the sheets during shipment.

3,963,123

CARDED HARDWARE ARTICLE PACKAGE

Glenn I. Beal, Somerset, Pa., assignor to R. M. Smith, Inc., Somerset, Pa.

Filed Mar. 20, 1974, Ser. No. 453,100
Int. Cl.[2] B65D 73/00
U.S. Cl. 206—495 5 Claims



1. A package comprising:

a. a sprinkler component article, said article having an axis of rotation, and said article being generally symmetrical about a center plane passing through the center of said article and the axis of rotation thereof and having a water-receiving socket bisected by said center plane, and said article including a body having a pair of spaced-apart plate portions thereof, one located on each side of said center plane, and said plate portions each having an aperture extending therethrough, said apertures being located near the center of gravity of said article, being specially formed for mounting of said article on a card, and being disposed on opposite sides of the axis of rotation of said article,

b. a display card of an area greater than the outline configuration of said article receiving said article on one surface thereof with said plate portions disposed in spaced parallel relation thereto, and

c. fastening means for fastening said article to said card, said fastening means comprising a fastener shank extending through each aperture, said fastener shanks being engaged through said card, and enlarged generally flat head means integral with each fastener shank, said head means engaging the surface of said card opposite the surface thereof receiving said article, said fastening means securely holding said article to said card and preventing rotation of said article relative to said card.

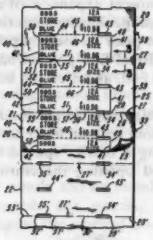
3,963,124

WEB OF RECORD ASSEMBLIES

Paul J. Banks, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 281,591, Aug. 17, 1972, Pat. No. 3,885,334. This application Jan. 10, 1975, Ser. No. 540,043
Int. Cl.[2] B65D 73/00; G09F 3/10
U.S. Cl. 206—527 23 Claims

1. A web of record assemblies, comprising: a longitudinally extending web of record material, a web of backing material, and pressure-sensitive adhesive releasably adhering the web of record material and the web of backing material to each other, the record material web being at least partially severed along longitudinally spaced-apart transverse lines to provide a plurality of record assemblies, a plurality of groups of cuts through the record material of each record assembly, the cuts of each group extending at their one ends to a respective transverse line, and means partially severing the record material between the other ends of each group to provide a removable record part in each record assembly.



3,963,125

RACK FOR STORING TRAYS OR THE LIKE

George T. Baggott, Cleveland, Ohio, assignor to Crescent Metal Products, Inc., Cleveland, Ohio

Filed Jan. 23, 1975, Ser. No. 543,279
Int. Cl.[2] A47F 3/14, 47/00
U.S. Cl. 211—126 6 Claims

1. A rack for storing trays or the like comprising:

a. at least two laterally spaced parallel assemblies each of which comprises

1. two laterally spaced parallel posts having a plurality of longitudinally spaced slots,

2. a plurality of longitudinally extending support members interposed between the posts, each support member having at least three longitudinally extending angularly related surfaces and a ledge for supporting the side of a tray, each end of each support member having only and able to have only endwise entry and withdrawal into and out of a position of retaining engagement with one of the slots with a central one of said angularly related surfaces being received in said slot, and those of said surfaces either side of said central surface having engagement with opposite sides of said post adjacent said slot to prevent rolling of the support member about its length and out of engagement with said posts, one of the support members at each end of the assembly being secured in the slots;

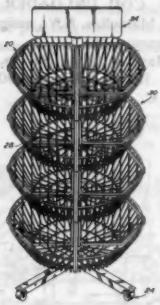
b. means extending between and attached to the assemblies for positioning and securing the assemblies in a parallel spaced relationship.

3,963,126

REVOLUBLE TIERED BIN STAND

Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust U/A, Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,629
Int. Cl.[2] A47F 3/14
U.S. Cl. 211—131 6 Claims



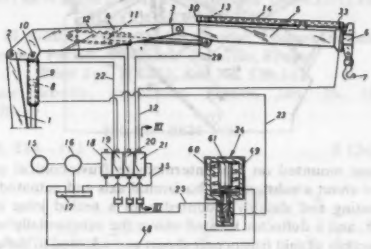
1. In a display stand including
a support pedestal,
vertical shaft means rotatably supported on said pedestal,
a series of vertically-spaced basket-like bin means, each said bin means consisting essentially of a plurality of sector-like trays disposed to abut one another laterally along radially extending side margins thereof, said trays being circumferentially arranged so as completely to encircle said shaft means,
securement means detachably fastening said bin means as a tier in a tiered array on said shaft means for rotation therewith, said securement means comprising a pair of vertically spaced probes constituting rod-like projections unitary with each tray at radially inward extremities of each tray, said projections on each tray being disposed normally to one another with a first projection extending substantially parallel to said shaft means and a second projection extending substantially perpendicular thereto, each projection being adapted to penetrate into and to seat within a corresponding aperture formed in said shaft means, thereby to secure each tray detachably thereon,
tray intercoupling means mechanically interlocking adjacent trays of each tier to one another at side margins thereof to stabilize and brace each tier of the tiered array, said intercoupling means consisting essentially of an L-shaped flange including a horizontally projecting rod-like support and an integrally formed upwardly directed area, means fastening said flange to extend laterally outwardly from a lower framing element of each one of said trays, said flange defining an upwardly opening slot receiving therewithin a lower framing element of an adjacent tray, whereby said flange serves both as an auxiliary support for an adjacent tray and as interlock means for contiguous trays of each tier;
the improvement wherein said display stand further comprises a header card and connector means for mounting said header card on said shaft means to extend upwardly therefrom,
said connector means comprising a web joined to and depending downwardly from said header card, said web being dimensioned laterally to provide a sliding fit of said web downwardly into an axial opening formed at the top of said shaft means, said web having a radially directed slot extending inwardly from an outer edge of said web, and
a web-coupling washer dimensioned to be received within said shaft means and to extend transversely thereof therewithin, said washer being formed with a radially inwardly directed slot adapted matingly to receive said web of said header card therewithin as said washer is simultaneously received within said web upon intercoupling of said web with said washer at respective slots formed therein,
thereby to stabilize said header card against axial tilt upon insertion of said web with the intercoupled said washer into said shaft means.

3,963,127

BLOCKING ARRANGEMENT IN HYDRAULICALLY OPERATED CRANES

Mats Erik Eriksson, Hudiksvall, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed May 2, 1972, Ser. No. 249,564
The portion of the term of this patent subsequent to Feb. 15, 1992, has been disclaimed.
Int. Cl.[2] B66C 13/48, 23/06
U.S. Cl. 212—8 R 11 Claims



1. A hydraulically operated crane including a vertically swingable boom having an extension adapted to carry a load, a first piston-cylinder arrangement adapted to raise and lower said boom, and a further piston-cylinder arrangement adapted to project and retract said extension whereby the moment arm loading on said boom is altered principally incident to such projection and retraction of the extension;
a first control valve means for selectively operaing said first piston-cylinder arrangement;
a further control valve means for selectively operating said further piston-cylinder arrangement, and including a control member having an intermediate position in which operation of said further piston-cylinder arrangement is blocked, a first operative position on one side of said intermediate position in which said extension is moved in projecting direction, and a second operative position on the other side of said intermediate position in which said extension is moved in retracted direction; and
actuator means connected to that side of said first piston-cylinder arrangement which takes up said moment arm loading for forcing said control member from said first operative position thereof to said intermediate position thereof in response to moment arm loading exceeding a predetermined value.

3,963,128

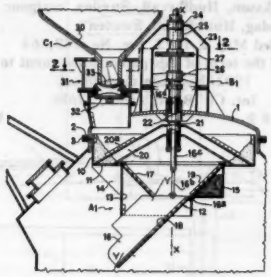
CHARGING DEVICE FOR A BLAST-FURNACE

Henry Volturiez, Dunkerque, and Rene Aymard, Grande Synthe, both of France, assignors to Union Siserugique du Nord et de l'Est de la France, Paris, France

Filed Jan. 13, 1975, Ser. No. 540,424
Claims priority, application France, Jan. 14, 1974, 74.01159
Int. Cl.[2] F27B 1/12
U.S. Cl. 214—35 R 5 Claims

1. A charging device for a blast-furnace having a dome, comprising a frame supported by said dome outside the blast-furnace, a tubular shaft mounted with a sealed joint to extend

through the dome of the blast-furnace and carried by the frame, a rotatable spout structure disposed in the upper part of the blast-furnace and suspended from said tubular shaft through suspension arms, guide, drive and control means for said tubular shaft,disposed outside the blast-furnace, the rotatable spout structure comprising an upper portion formed by a substantially cylindrical wall whose diameter is slightly less than the diameter of the dome of the blast-furnace and substantially centered on the axis of the blast-furnace, and by a substantially horizontal planar ring, a frustoconical intermediate part extending downwardly from said planar ring and having an oblique axis and a substantially vertical generatrix,



a nose mounted on said intermediate frustoconical part to pivot about a substantially horizontal axis and actuated by an actuating rod slidably mounted with a sealed joint in said shaft, and a deflector located above the substantially vertical generatrix of said frustoconical part and adapted to deflect the charge onto, and distribute it over, the opposite wall of the frustoconical part of the spout, said deflector being upwardly convex and being protected by lining or facing means of resistant material, said charging device further comprising two bins for feeding the charge to the spout structure, each of said bins comprising a discharge hopper which has a substantially vertical axis and opens into the blast-furnace in the vicinity of the periphery of the upper part of the spout structure.

3,963,129

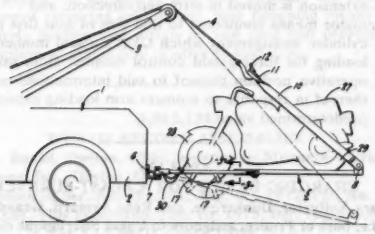
MOTORCYCLE CARRIER

Jack E. Clayton, 2439 E. Oak St., Stockton, Calif. 95205

Filed Jan. 20, 1975, Ser. No. 542,579

Int. Cl.² B60P *3/12*; B60R *9/00*

U.S. Cl. 214—86 A **4 Claims**



1. A motorcycle carrier for use with a tow truck including a crane having a lift cable adapted to depend rearwardly of the truck; the carrier comprising a longitudinal boom unit projecting rearwardly from the truck, means coupling the boom unit at its front end to the truck, the boom unit being of a structural configuration to support a motorcycle thereon, and means suspending the boom unit from the lift cable; the suspension means comprising a pair of straps secured at their lower ends to the rear portion of the boom unit and thence extending upwardly therefrom for connection with the lift cable above a motorcycle supported on the boom unit; said pair of straps straddling the supported motorcycle and stabilizing the same against lateral tilting.

3,963,130

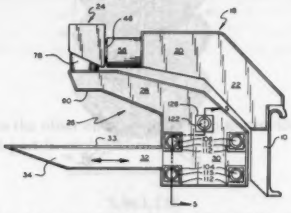
COIL UNLOADER

James J. Maynard, Marcellus, N.Y., assignor to Syracuse Supply Co., Inc., Syracuse, N.Y.

Filed May 15, 1974, Ser. No. 470,057

Int. Cl.² B66C *23/00*

U.S. Cl. 214—130 C **3 Claims**



1. An unloading apparatus for use with a truck, said apparatus including:

a stationary member having two ends with one of said ends being spaced from the truck;

means connecting the other of said ends to the truck;

a junction member;

a first connecting means operably connecting said spaced end of said stationary member to said junction member;

a first rotating means forming a part of said first connecting means, whereby said junction member can be rotated relative to said stationary member;

a rotatable member;

a second connecting means operably connecting said rotatable member to said junction member and including a sleeve having two ends with one of said ends fixed to the junction member, a threaded portion on the other end of said sleeve, said threaded portion extending into said rotatable member, a nut screwed on said threaded portion, means on said rotatable member engaged by said nut whereby the sleeve is operably connected to said rotatable member; and

a second rotating means forming a part of said second connecting means, whereby said rotatable member can be rotated relative to said junction member.

3,963,131

FRONT-END SKID STEER LOADER

Donald J. Dimmer, Thief River Falls, Minn., assignor to Hydra-Mac, Inc., Thief River Falls, Minn.

Filed Jan. 6, 1975, Ser. No. 539,015

Int. Cl.² E02F *3/36*

U.S. Cl. 214—140 **4 Claims**

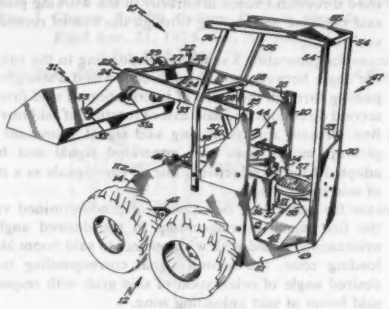
1. A compact skid steer front-end loader comprising:

a body including a pair of substantially similar body sections, each section including a vertical, substantially flat side wall, each having a vertical rear edge, a substantially flat bottom wall portion integral with and having a length corresponding to the length of the associated side wall, each section including a substantially flat front wall portion integral with the associated side wall and bottom wall portion, each front wall portion having a vertical dimension less than the vertical dimension of the associated side wall and having a width dimension corresponding to the width dimension of the associated bottom wall portion,

the bottom wall portions and front wall portions of said sections being disposed in lapped relation, and being fixedly secured together,

a pair of substantially flat, upstanding boom support plates, each affixed to one of said side walls adjacent the rear of and projecting upwardly therefrom,

a boom assembly pivotally connected to the boom support plates and projecting forwardly therefrom, an implement pivotally mounted on the forward end of said boom assembly, means for pivoting the boom assembly about its pivot axis, and means on the boom assembly for pivoting the implement relative thereto,



front and rear pairs of ground-engaging wheels supporting said body for travel over the surface of the ground, means for driving said ground-engaging wheels,

said rear ground engaging wheels being positioned forwardly of the rear vertical edge of each side wall,

a cab structure including a floor plate, a back plate integral with said floor plate and extending upwardly therefrom, means connecting said cab structure to the rear portion of said body, whereby said cab structure is positioned rearwardly of the body, and rearwardly of said ground engaging wheels and said boom support plate.

3,963,132

PUBLIC WORKS APPLIANCE

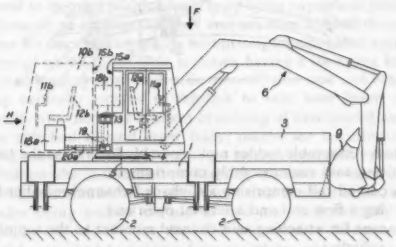
Serge P. Dufour, Dammartin-en-Goele, France, assignor to Societe Anonyme: Poclain, Le-Plessis-Belleville, France

Filed July 10, 1974, Ser. No. 487,364

Claims priority, application France, July 16, 1973, 73.26009

Int. Cl.² E02F *3/00*

U.S. Cl. 214—142 **3 Claims**



1. A public works appliance comprising: a frame which includes means for displacing the appliance, a chassis mounted on said means and a turret mounted on the chassis for rotation relative to the chassis; a working attachment and a control cab housing a single control station for selectively causing displacement of the appliance and operation of the working attachment, means for mounting said working attachment and said control cab on said turret, the control cab mounting means enabling rotation of the control cab relative to the working attachment so as to be selectively disposed in first and second positions relative thereto which positions are spaced apart from one another by substantially 180°, a counterweight mounted on said turret, and means for shifting said counterweight between a first position offset laterally and rearwardly with respect to said cab when said cab is in its first position and a second position to permit said cab to be shifted from its first to its second position, said counterweight being disposed at the rear of said cab when said cab is in its second position, the arrangement being such that the working attachment is visible from the one face of the cab when the latter is in the first position, the field of vision from the same face of the cab in the second position thereof being unobstructed by the working attachment.

3,963,133

PUBLIC WORKS MACHINE HAVING A REMOVABLE COUNTERWEIGHT AND METHOD OF DISMANTLING SAID COUNTERWEIGHT

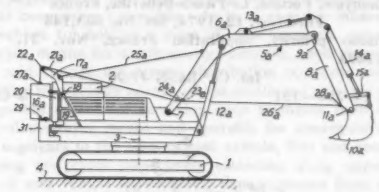
Andre M. Gilli, Crepy-en-Valois, France, assignor to Societe Anonyme: Poclain, Le Plessis -Belleville, France

Filed Jan. 7, 1975, Ser. No. 539,181

Claims priority, application France, Jan. 16, 1974, 74.01476

Int. Cl.² E02F *9/18*

U.S. Cl. 214—142 **5 Claims**



1. A public works machine comprising, a frame, a first jib element movably mounted on said frame, means for varying the position of said first jib element with respect to the frame, said jib element extending from one side of said frame, a beam element mounted on said first jib element for movement with respect to said first jib element, means for moving said beam element with respect to said jib element, a counterweight associated with said frame on the side thereof opposite said first jib element, an auxiliary jib element pivotally mounted on said frame adjacent said counterweight; a first connection member of constant length connected between said first jib element and said auxiliary jib whereby movement of said first jib is followed by movement of said auxiliary jib; said auxiliary jib including means for guiding a flexible element, said guiding means being located on the auxiliary jib above the counterweight, and a flexible connection element operatively connected between the counterweight and said beam element and guided on said auxiliary jib by said guide means, whereby said counterweight will move in response to movement of said jib and beam elements by their associated moving means.

3,963,134

MACHINE HAVING A DUAL FUNCTION JIB

Jean E. Leroux, Le Plessis-Belleville, France, assignor to Poclain, Le Plessis-Belleville, France

Filed Apr. 3, 1975, Ser. No. 564,655

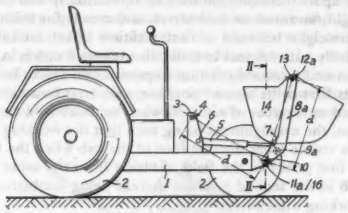
Claims priority, application France, Apr. 22, 1974, 74.13944

Int. Cl.² E02F *3/81*

U.S. Cl. 214—145 R **3 Claims**

1. A machine comprising: a frame; a boom; two distinct hinge locations arranged on and fixed relative to the frame for

coupling the boom to the frame; two couplings provided on the boom which correspond one with one of the hinge locations and the execution of one specific operation, and the other with the other hinge location and the execution of another specific operation; said couplings each defining a hinge axis, the separation of the hinge axes being equal to the distance between the hinge locations; and means for adjustment of the relative position of this boom with respect to this frame.



3,963,135

METHOD OF SUBORDINATING THE ORIENTATION OF A GRAB ON A PUBLIC WORKS MACHINE TO THE ROTATION OF THE TURREST OF THIS MACHINE AND TO THE MACHINE

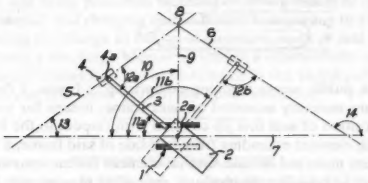
Yves G. Coeurderoy, Lagny-le-Sec, France, assignor to Societe Anonyme: Poclain, Le-Plessis-Belleville, France

Filed Nov. 12, 1974, Ser. No. 523,148

Claims priority, application France, Nov. 21, 1973, 73.41494

Int. Cl.² B65G *47/90*

U.S. Cl. 214—151 **8 Claims**



1. A method of subordinating the orientation of a grab rotatably mounted at the end of a boom supported on the rotatable turret of a Public Works machine, to the rotation of said turret, as a function of the relative locations of loading and unloading zones of said grab and of the axis of rotation of said turret on the frame of said machine, the method being intended to enable presentation of the grab at the said two zones in constant orientations, the method comprising:

choosing three directions, the first direction being determined by the desired orientation of said grab in said loading zone, the second direction being determined by the desired orientation of said grab in said unloading zone, and the third direction passing through said axis of rotation of said turret,

measuring the angle of rotation of the turret starting from said third direction and comparing it with the angle between said third direction and a straight line passing through the point of intersection of said first and second directions and through said axis of rotation of said turret,

determining the angle which said grab must take up with respect to said boom to remain in one or other of said first and second directions,

measuring the angle which said grab actually makes with said boom, comparing it with said determined angle, and controlling the rotation of said grab with respect to said boom in dependence on said comparison to bring said measured angle to equality with said determined angle.

6. In a Public Works machine for transferring material from a loading zone associated with a first direction to an unloading zone associated with a second direction, and comprising a frame, a turret mounted for rotation on said frame, a boom supported on said turret and carrying at its free end a grab which is mounted to rotate relative thereto, drive means for rotating said turret with respect to said frame and drive means for rotating said grab with respect to said boom, the improvement comprising:

a first pick-up means for generating a signal corresponding to the angle of rotation of said turret with respect to a third direction chosen arbitrarily in the working plane of said machine and passing through the axis of rotation of said turret,

means for generating a signal corresponding to the value of the angle between said third direction and a straight line passing through the point of intersection of said first and second directions and said axis of rotation of said turret,

a first element for comparing said signal from said first pick-up means with said generated signal and being adapted to emit selectively one of two signals as a result of said comparison,

means for generating two signals of predetermined value, the first signal corresponding to the desired angle of orientation of said grab with respect to said boom at said loading zone, the second signal corresponding to the desired angle of orientation of said grab with respect to said boom at said unloading zone,

a selector connected to said two signal generating means for emitting a signal selected from said two signals as a function of the value of the signal which it receives from said first comparator element,

a second pick-up means for emitting a signal corresponding to the angle of orientation of said grab with respect to said boom,

a second element for comparing the signal from said selector and said second pick-up means and emitting a signal for controlling said drive means for rotating said grab with respect to said boom so as to nullify the difference between the two signals which said second element compares.

3,963,136

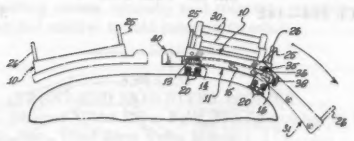
RETRACTABLE LADDER RACK

Theodore J. Spanke, 1834 Dracena, Bakersfield, Calif. 93304

Filed Jan. 10, 1975, Ser. No. 540,153

Int. Cl.² B60R *9/00*

U.S. Cl. 214—450 **16 Claims**



1. A retractable ladder rack assembly for use on the top of vehicles, said rack assembly comprising:

a curved rail comprising a C-shaped channel member having a first end and a second open end;

means for attaching said channel member to the top of the vehicle;

at least three anti-friction members adapted to ride in said channel and positioned so that said anti-friction members are within said channel member when said rack is in a retracted position and so that at least two but not all of said anti-friction members remain within said channel member when said rack is in an extended configuration, the members remaining within said channel being re-

tained members, said retained members being in close proximity to each other;

a rack supported by said anti-friction members and said channel member to permit movement along said channel member from the first end thereof to and partially past the second end thereof when said rack is moved from its retracted position to its extended configuration; and

spring means attached to said rack by flexible cable means positioned within said channel and urging said rack towards the first end of said channel member.

3,963,137

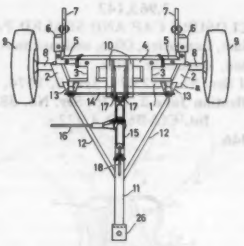
VEHICLE FOR HANDLING MULTI-FURROW PLOUGH

William J. Chayer, Box 99, Cottam, Ontario, Canada

Filed Apr. 21, 1975, Ser. No. 569,775

Int. Cl.² A01B *59/043*

U.S. Cl. 214—501 **4 Claims**



1. A vehicle for handling and transporting multi-furrow ploughs constructed mainly of rectangular box cross-section steel, comprising a main body consisting of a horizontal base beam having an upwardly bent section at a diverging angle at each end thereof, an upper shorter beam spaced from and parallel to said base beam, attached to said base beam by a plurality of upright stays; a rubber tired wheel attached to each of said upwardly bent base sections; an L shaped member sliding in or out of each end of said upper beam; corresponding spaced holes in said upper beam and its contained L shaped member for locking said L shaped member in a required position by passing a pin through lined up holes; a short section sliding telescopically over the top of the upright of each of said L shaped members; corresponding holes in the upright part of the L and the telescopic sections sliding upon it, for locking said telescopic section at the required height by passing a pin through lined up holes; a hook of heavy steel plate rigidly attached to one side of each of said telescopic sections, said hook being provided with a two walled swivably attached snap having a semi-circular cavity in the upper edge thereof in its open position, said snap being capable of folding backwardly to enclose the hook and any item hooked therein; means for drawing the vehicle comprising an elongated arm by means of which the vehicle is drawn having a diverging knee brace extending from each side thereof, said arm and braces being centrally located in relation to said base beam and swivably attached to a bracket consisting of two spaced angle irons attached to said main body; means for lowering and raising the said hooks comprising a ratchet operated cylinder tapped on the inside and containing a screw in each end thereof, said screws being opposite thread to each other, said cylinder being located on top of said arm and swivably attached by one end thereto, the other end of said cylinder being swivably attached to a pair of spaced plates slidably located within said angle iron bracket, and said angle irons of the bracket and contained plates being provided with corresponding holes by means of which the cylinder attachment at the main body can be determined by lining up said bracket and plate holes and passing a pin through them; and the rotation of said ratchet in one direction expands the distance between the ends of the screws so that the said hooks are lowered towards the ground to pick up the free end of a multi-furrowed plough, while the rotation of said ratchet in the opposite direction lifts up the hooks and their captured free end of the plough to make the vehicle and the plough mobile.

3,963,138

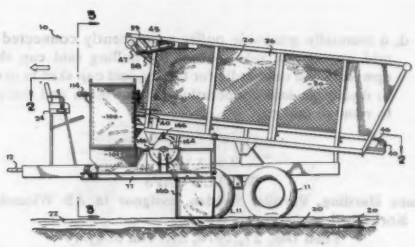
CANE PLANTER

Larry G. Fowler, Belle Glade, Fla., assignor to Sugar Cane Growers Cooperative of Florida, Belle Glade, Fla.

Filed Mar. 10, 1975, Ser. No. 557,169

Int. Cl.² B60P *1/38*

U.S. Cl. 214—519 **8 Claims**



1. A field operated cane planter for depositing cane seed piece segments in first and second parallel furrows, said planter comprising a movable vehicle, storage bin means on said vehicle for holding a mass of cane segments, removal conveyor means for continuously removing cane segments from said storage bin means, distribution conveyor means extending transversely of said vehicle positioned adjacent said storage bin means for receiving cane segments from said removal conveyor means and operable for conveying said cane segments to the sides of said vehicle, first and second dropping conveyors respectively extending along opposite sides of said vehicle for receiving cane segments from said distribution conveyor means and depositiong the cane segments in one of said furrows and drop guide means associated with each of said dropping conveyor means for guiding said cane segments as they fall from the dropping conveyor means into the furrows to cause the cane segments to be oriented generally parallel to the furrows, and distribution conveyor means comprising first and second transversely aligned chain conveyors positioned adjacent the front of said bin means and each including a generally horizontal conveyor leg defining its inner extent from which it feeds outwardly and an upwardly inclined conveyor leg defining its outer extent and first and second inclined chute slide means for guiding cane segments from the outer ends of said inclined conveyor legs onto said dropping conveyors.

3,963,139

TAMPER-INDICATING CLOSURE COMBINATION

Peter Paul Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Aug. 22, 1975, Ser. No. 606,889

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—216 **14 Claims**

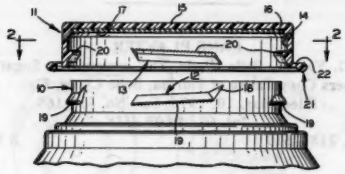
1. A tamper-indicating closure combination for a container having a neck, said combination comprising

a. an inverted generally cup-shaped cap having a flexible skirt that is adapted to fit over said container neck and close the same,

b. cooperating threads on the inner side of said cap skirt and the exterior of said container neck,

c. said cap and container neck having opposed cooperating ratchet teeth on adjacent surfaces which are engaged when said cap is rotated onto said neck thereby preventing retrograde rotation of said cap relative to said neck

without disengagement of said cooperating ratchet teeth, and



d. a manually graspable puller permanently connected to said cap at one side thereof for pulling said cap skirt upwardly and outwardly for flexing said cap skirt in order to disengage said cooperating ratchet teeth and thereby to remove said cap.

3,963,140

BOTTLE CAPS

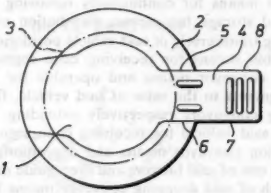
Sune Harding, Partille, Sweden, assignor to AB Wicanders Korkfabriker, Alvangen, Sweden

Filed Dec. 27, 1974, Ser. No. 536,719

Claims priority, application Sweden, May 10, 1974, 7406245

Int. Cl.² B65D *41/42*

U.S. Cl. 215—254 **6 Claims**



1. A cap for a container having a neck defining an opening, said cap comprising an upper wall to overlie the opening and having a peripherally depending skirt to engage the neck to secure the cap in position over the opening and a tear tab projecting radially from said skirt, and score lines on said wall defining a tear portion, said score lines consisting of two weakening lines traversing the cap at least one of which extends across opposite portions of said skirt substantially in line with an edge of said tear tab, each of said weakening lines on said upper wall being arranged substantially adjacent and parallel to the boundary between said upper wall and the skirt, and a peripheral sealing element bonded to the inside surface of the wall and covering said inside surface of the wall along the length of said score lines.

3,963,141

CLOSURE CAP WITH SELF-OPENING MEANS

Ming-Jen Liu, 152, Wen Wu Erh St., Chien Chin District, Kao Hsiung, China /Taiwan

Filed May 21, 1975, Ser. No. 579,439

Int. Cl.² B65D *41/12*

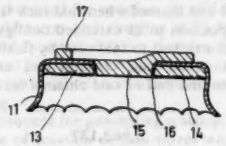
U.S. Cl. 215—254 **3 Claims**

1. A self-opening closure cap for a container comprising:

a metal crown cap body having a hole at the central portion thereof;

a seal placed under said cap body for creating a fluid-tight seal between said cap body and said container, and having a core portion in coincidence with said hole of said cap body; and

a ring shaped portion integral with said seal placed above said cap body and connected to said core portion of said seal through said hole of said cap body, said core portion



being severable from said seal upon the application of a pulling force on said ring-shaped portion to thereby expose the contents of said container through said hole.

3,963,142

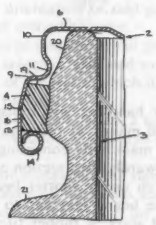
SIDESEAL CLOSURE CAP AND SEALED PACKAGE

Alexander W. Hart, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Continuation of Ser. No. 432,079, Jan. 9, 1974, abandoned. This application June 2, 1975, Ser. No. 582,650

Int. Cl.² B65D *41/22*

U.S. Cl. 215—346 **5 Claims**



1. A closure cap having a cover portion and a generally cylindrical depending skirt portion, said skirt portion having a step in its top portion with a vertical upper portion and a horizontal shoulder joining at an annular inwardly directed bead of U-shaped cross-section with the bead being the radially innermost portion of said skirt portion and extending radially inwardly of said step vertical portion, the lower edge of said skirt portion comprising an inwardly rolled second bead, said beads being connected by a V-shaped portion of said skirt to form a gasket receiving channel, an annular cut gasket positioned within said gasket receiving channel having a rectangular cross-section with the cross-sectional depth exceeding the cross-sectional width, and the radially inward edges of said beads extending more than half way inwardly of the gasket width.

3,963,143

CONTAINER INCLUDING AN ALUMINUM PANEL HAVING A PORTION REMOVABLE BY TEARING

William Albert Anderson, Pittsburgh; Arvil Burke McKee, Lower Burrell, and John Knox McBride, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed June 30, 1975, Ser. No. 591,700

Int. Cl.² B65D *25/34*

U.S. Cl. 220—64 **24 Claims**

1. In a hermetically sealed container including an aluminum panel, the improvement wherein said panel is composed of a composite aluminum alloy sheet comprising a core and a cladding layer adapted to face the container contents, said core being composed of an aluminum base alloy consisting essentially of 1 to 7 percent total of one or more elements

selected from the group consisting of up to 3% copper, up to 4% magnesium and up to 1.5% manganese, the balance being essentially aluminum and incidental elements and impurities, said cladding alloy consisting essentially of less that 1% zinc, balance essentially aluminum and incidental elements and impurities, the solution potential of the core and cladding being such that the cladding is from 15 to 125 millivolts more anodic than the core.

3,963,144

TRANSPORT CONTAINER FOR DANGEROUS LIQUIDS

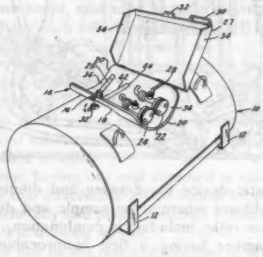
Ernst Berwald, Bergkamen-Heil, Germany, assignor to Schering Aktiengesellschat, Berlin and Bergkamen, Germany

Filed Dec. 12, 1974, Ser. No. 532,004

Claims priority, application Germany, Dec. 20, 1973, 2363471

Int. Cl.² B65D 25/00

U.S. Cl. 220—85 P 4 Claims



1. In a generally cylindrical transportation container for dangerous liquids having an upper portion and charging and emptying fittings on said upper portion, an elongated upwardly opening semi-cylindrical protective shell for the fittings positioned chordally on said container with its longitudinal axis transverse to the longitudinal central axis of said container; said shell being generally rectangular in plan and mounted on said upper end portion of said container with its central portion intercepting the periphery of the container and being located within the container; said shell having a pair of exposed end portions which extend outwardly of and beyond the periphery of said container, said end portions being located on opposite sides of said longitudinal central axis of said container in spaced parallel relation to each other and being opened to allow drainage of liquid from the shell; said fittings being positioned in said shell.

3,963,145

ANTI-BURGLARY CHEMICAL DISPENSING DEVICE

Charles R. Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605, and Werner F. Esselunn, 12 Larchwood Road, Wyomissing, Pa. 19610

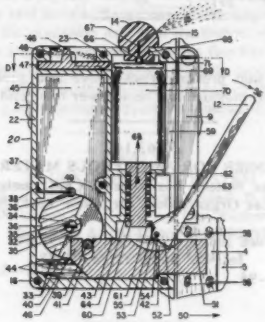
Filed Dec. 6, 1974, Ser. No. 530,131

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² B65D 83/14; G08B 15/02

U.S. Cl. 222—5 10 Claims

1. A chemical dispensing anti-burglar device for use with a pressurized container, the device comprising: a body member; means for slideably supporting said pressurized container in said body member; a fluid passageway extending through said body member having an entry section; means for causing the discharge of fluid from said container into said entry section of said fluid passageway; a spring actuating member supported in said body member and arranged to actuate said discharging means upon movement of said slideably supported pressurized container when said biased actuating member is released; means for releasably retaining said biased actuating member in a cocked position; said retaining means including a trigger element; said trigger is element being mounted for movement between an actuation position and a release position; said trigger element in said actuation position being in engagement with said biased actuating member to retain said biased actuating member in a cocked position; said trigger element in said release position allowing said biased actuating member to actuate said discharging through movement of said pressurized container whereby the means for discharging fluid causes discharge; means for locking said trigger element in engagement with said biased actuating member; said locking means being mounted for movement between a locked position and



a release position; said locking means in said locked position securing said trigger element in engagement with said biased actuating member; and said locking means in its release position permitting said trigger element to move to its release position; and means external to said body member for releasably retaining said trigger element in its actuation position; said external retaining means including a latch plate mounted separate from said body member; said body member being movable between a first position in which said external retaining means retains said trigger element in its actuation position; and a second position in which said external retaining means allows said trigger element to move to its release position.

3,963,146

LIQUID-DISPENSING INSTALLATION

Stig Uno Ingvar Esbjornsson, Malmo, Sweden, assignor to Aktiebolaget Ljungmans Verkstader, Malmo, Sweden

Filed June 5, 1974, Ser. No. 476,754

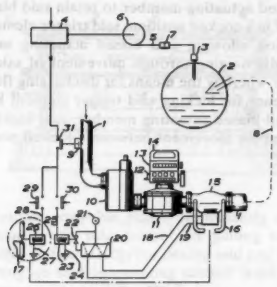
Claims priority, application Sweden, June 5, 1973, 7307889

Int. Cl.² B67D 5/28

U.S. Cl. 222—59 7 Claims

1. An installation for dispensing liquid, such as vehicle fuel, heating oil etc, from a liquid-delivering container to a liquid-receiving container, such as the tank of a vehicle, the oil tank of a building etc, conduit means for communication between said containers including means for air separation, means for metering the liquid volume dispensed, means for interrupting the dispensing operation, having first valve means in said conduit means and second valve means in a conduit by-passing said first valve means, control means responsive to the pressure in the conduit means upstream of said first valve means for closing said first and second valve means when said

pressure sinks below a predetermined value, and for first opening said second valve means and not said first valve means when said pressure rises above said predetermined value after said pressure has been lower than said value.

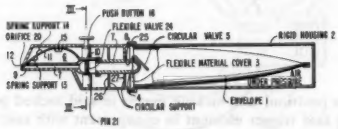


3,963,147

DISPENSER FOR AMORPHOUS MATERIAL

John Lawrence Waters, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 8, 1975, Ser. No. 539,449
Int. Cl.² B65D *35/28, 35/48*
U.S. Cl. 222—95 **2 Claims**



1. A dispenser for substantially amorphous material stored in a flexible envelope, said dispenser comprising

a substantially rigid housing accommodating a flexible envelope of material, said housing having air under pressure therein and having an open end coincident with the open end of the envelope of material and a housing cover of substantially flexible material enclosing the open end of the housing and having an opening formed through the housing cover and a valve for opening and closing the opening to permit the passage of material from the envelope; and

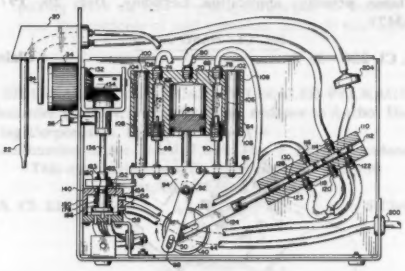
a dispenser unit removably affixed to the housing at the cover thereof and having a substantially tubular member extending at one end into the envelope of material via the opening in the cover of the housing and having valve means in the area of the other end of the tubular member and intermediate both ends, part of said tubular member comprising substantially flexible material, and said valve means comprising substantially arcuate spring means in the dispenser unit having one end in operative proximity with the other end of the tubular member, guide means in the dispenser unit for guiding movement of the spring means and a push-button movably mounted in the dispenser unit and affixed at one end to the other end of the spring means in operative proximity with the flexible material part of the tubular member and extending out of the dispenser unit at the other end of the push-button whereby spring action of the spring means maintains the one end of the spring means in blocking position closing the other end of the tubular member and depression of the push-button moves the spring means in the guide means in a manner whereby the one end of the spring means is moved to open position opening the other end of the tubular member.

3,963,148

APPARATUS FOR DRAWING, MEASURING AND DISCHARGING PROPORTIONAL AMOUNTS OF FLUID

Oscar Proni, Hollywood; Loran Vinson Melnick, and William Taylor Henderson, both of Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 432,348, Jan. 10, 1974, abandoned. This application Mar. 12, 1975, Ser. No. 557,681
Int. Cl.² B67D *5/60*
U.S. Cl. 222—132 **27 Claims**



1. An automatic device for drawing and diluting a first sample with a diluent wherein the sample and diluent are mixed in a precise ratio, including in combination,

a diluent chamber having a first reciprocable plunger therein,

a first sample chamber having a second reciprocable plunger therein,

coupling means coupled to said first and second plungers for moving said plungers an equal distance in said chambers, drive means including a motor having a rotating drive, cam means secured to said motor rotating drive and rotating therewith, said cam means having an eccentric thereon coupled to said coupling means for reciprocating said coupling means between first and second positions whereby said plungers are reciprocally moved equal distances,

said coupling means including eccentric follower means for following rotation of said eccentric, said eccentric follower means reciprocating said coupling means during first particular portions of each rotation of said cam and said eccentric for moving said coupling means to one of said first and second positions, said coupling means maintaining said first and second positions during second particular portions of each rotation of said cam and said eccentric,

said first plunger when moved in said diluent chamber displacing a first volume therein, said second plunger when moved in said sample chamber displacing a second volume therein, said first and second volumes having a fixed precise ratio with respect to one another for any equal distance moved by said first and second plungers in said chambers,

a valve assembly having a valve chamber coupled to said diluent chamber,

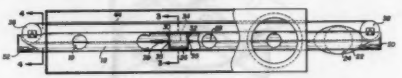
diluent intake passage means and diluent discharge passage means coupled to said valve assembly,

said valve assembly including a valve member shiftable between a first position wherein said valve chamber couples said diluent intake passage means to said diluent chamber, and a second position wherein valve chamber couples said diluent discharge passage means to said diluent chamber, and

shifting means coupling said valve member to said eccentric for shifting said valve member between said first and

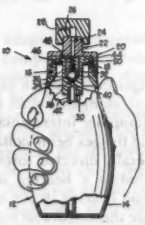
second positions during said second particular portions of each rotation of said cam and eccentric.

3,963,149
GRANULAR MATERIAL CONVEYOR
Arthur L. Fassauer, Canyon, Tex., assignor to Fassauer Industries, Inc., Canyon, Tex.
Filed Jan. 31, 1975, Ser. No. 545,809
Int. Cl.² B67D *5/52*
U.S. Cl. 222—142 **11 Claims**



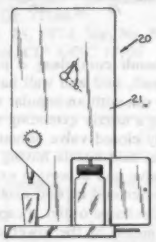
1. An apparatus for combining programmed amounts of different materials comprising:
a tube member adapted to receive the different materials to be combined, said tube member having an opening for receiving each different material and at least one opening for discharging the materials;
at least one metering dispensers each housing a different material and having a discharge opening for transmitting the material contained therein into said tube member;
a piston fitted within said tube member having an outer contour substantially conforming to the inner contour of said tube member;
a first line having one end attached to said piston and the other end attached to a first means for drawing said first line whereby said piston is moved within said tube toward said first drawing means;
a second line having one end attached to said piston and the other end attached to a second means for drawing said second line toward said second drawing means, said second drawing means being at the opposite end of said tube member from said first drawing means whereby said piston may be reciprocated within said tube member by alternately activating said first and said second drawing means; and
means for selectively operating said metering dispensers to dispense a preselected amount of each different material into said tube member ahead of the movement of said piston such that said different materials deposited within said tube member are combined and removed from said tube member.

3,963,150
PUFF-DISCHARGE SQUEEZE BOTTLE
Wolf Steiman, and Steven W. Beres, both of Bridgeport, Conn., assignors to VCA Corporation, Greenwich, Conn.
Filed May 21, 1974, Ser. No. 471,866
Int. Cl.² B05B *11/04*
U.S. Cl. 222—211 **5 Claims**



1. A squeeze bottle aerosol dispenser comprising, in combination:
a. a container having a neck portion and a movable wall portion adapted to be squeezed by the hand of the user,
b. a cap on said neck portion having an outwardly directed discharge nozzle with a hollow bore,
c. a hollow valve housing extending into said neck portion and having an annular flange supported by the rim of said neck portion and having an outlet communicating with said bore,
d. a spring-charged check valve means including an annular valve seat disposed in the hollow of the housing, a ball movable in the housing and engageable with the seat so as to seal against the same, and a spring carried in the housing normally biasing the ball in engagement with the seat, and
e. venting valve means carried by the container and communicating on the interior thereof for introducing air into the latter and relieving vacuum buildup therein following a discharge of the dispenser and release of the container movable wall, said venting valve means including a passage in said annular flange communicating with the interior of the container and with the hollow of the housing, and an annular, resilient, yieldable flap having its periphery gripped between said rim and the underside of said flange and normally covering one end of the passage but yielding in response to pressure buildup therein.

3,963,151
FLUID DISPENSING SYSTEM
Howard Lincoln North, Jr., Newfoundland, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Aug. 5, 1974, Ser. No. 492,031
Int. Cl.² G01F *11/06*
U.S. Cl. 222—309 **4 Claims**



1. A fluid dispensing system for accurately dispensing precise aliquots of fluid rapidly and efficiently comprising:
a pump adapted to be connected to a reservoir of fluid for transferring precise aliquots of fluid from the reservoir to an outlet orifice for dispensing fluid from the system upon demand;
an inlet tube having a bore therethrough and one open end for fluid communication with a reservoir and the other open end in fluid communication with the pump;
an outlet tube having a bore therethrough and one open end forming the outlet orifice for the system and the other open end in fluid communication with the pump;
control means connected to the pump to precisely regulate the amount of fluid in an aliquot transferred from a reservoir through the inlet tube, pump and outlet tube to the outlet orifice during an operating cycle of the pump;
a valve assembly in the system associated with the inlet and outlet tubes and the pump so as to normally close the bores in the tubes and to automatically shift to open the inlet tube while maintaining the closed outlet tube when the pump draws a precise aliquot from a reservoir, and to automatically close the bore of the inlet tube while opening the bore of the outlet tube when the pump dispenses the precise aliquot through the outlet orifice;

the inlet and outlet tubes being flexible elongated members; and

the valve assembly including a supporting member, a pair of pins extending laterally from the supporting member, the inlet tube resting on one of the pins and the outlet tube resting on the other of the pins, a cam arm pivotally mounted on the support and positioned so as to normally compress the inlet and outlet tubes, the arm being slidable and pivotable so as to be moved to a first acting position wherein the inlet tube is open to permit fluid to flow therethrough while the outlet tube is retained in the closed position and the arm being movable to a second acting position where the inlet tube is retained in closed position and the outlet tube is open to permit fluid to flow therethrough.

3,963,152

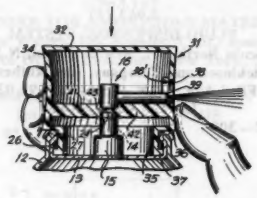
CHILDPROOF CAP FOR AEROSOL DISPENSER

Emanuel Landsman, 245 N. Broadway, Yonkers, N.Y. 10601, and Irving Landsman, 3530 Henry Hudson Parkway, Riverdale, N.Y. 10463

Continuation-in-part of Ser. No. 537,913, Jan. 2, 1975. This application Mar. 10, 1975, Ser. No. 557,229

Int. Cl.² B65D *83/14*

U.S. Cl. 222—402.13 5 Claims



1. An aerosol bomb comprisng a pressurized container having a top end wall, said end wall having a longitudinally upstanding annular rim with an annular retaining flange at its free end and having a nozzle extending axially from said end wall and a normally closed valve actuated by inward movement of said nozzle, said nozzle having a portion extending axially from said valve and a portion extending substantially radially from the outer end of said axial portion, said radial portion defining a discharge outlet, a cap having a continuous annular side wall, means at the lower end of said side wall interengaging with said retaining flange for retention of said cap on said rim yet permitting limited relative longitudinal movement between said cap and said rim and nozzle a predetermined distance between a retracted dispensing position and an extending nondispensing position, and inwardly movable actuator means carried by said cap to grip said axial nozzle portion for axial inward movement of said nozzle and actuation of said valve only when said cap is moved from said extended position to said retracted position and said inwardly movable actuator means are actuated, said cap having means in the side wall thereof to permit discharge therethrough of the container contents through the nozzle discharge outlet when the valve is actuated.

3,963,153

LEVER ACTUATED CAPTIVE CAN CLOSURE

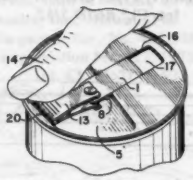
Herbert Arthur Bly, 18 Woodland Drive, East Windsor, N.J. 08520

Filed Feb. 8, 1974, Ser. No. 440,739

Int. Cl.² B65D *47/10*

U.S. Cl. 222—541 5 Claims

1. An easy-opening closure for containers comprising a lever member with an integral spring fulcrum member, said lever member affixed to one end of a sliding closure member formed as an integral part of the container lid and retained therein before, during and after opening by guide grooves engaging the lateral edges of said closure member; a depressed pivot notch in the container lid positioned to receive and engage the free end of said spring fulcrum member when the lever-and-fulcrum is raised; a vent at the end of the closure



member attached to the lever member, formed when the lever-and-fulcrum is raised, breaking the closure seal, said elements forming a lever and fulcrum assembly attached to the vented, sliding closure, for the purpose of applying lateral force to displace said closure upon application of downward pressure on the lever face.

3,963,154

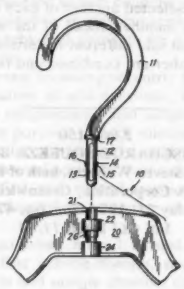
GARMENT HANGER CONSTRUCTION

Michel S. Schwartz, Great Neck, N.Y., and William Blasnik, Demarest, N.J., assignors to Lerner Manufacturing, Inc., Melville, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,957

Int. Cl.² A47J *51/098*

U.S. Cl. 223—85 9 Claims



1. A garment hanger construction comprising in combination a hook having an elongated shaft including flexible projecting flanges substantially intermediate the lengthwise extent of said shaft, said flanges being collapsibly flexed together in response to a laterally directed force applied thereto, and a hanger body including a bearing sleeve dimensioned to receive said shaft, said bearing sleeve including recess means disposed intermediate the lengthwise extent of said bearing for nesting said flanges so that portions of said bearing sleeve rotatably secure both lengthwise portions of said elongated shaft adjacent said flanges to thereby journal said elongated shaft in said bearing sleeve.

3,963,155

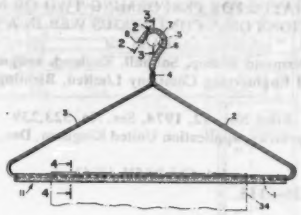
DUAL GARMENT HANGERS

Austin W. Bish, Sherwood Park, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Continuation-in-part of Ser. No. 428,703, Dec. 27, 1975, abandoned. This application Feb. 12, 1975, Ser. No. 549,345

Int. Cl.² A47J 51/094

U.S. Cl. 223—88 2 Claims



1. A garment hanger, which comprises:

a. two wires each forming a closed configuration having a longitudinally extending lower portion, two inclined portions each having a lower end connected opposite ends of said lower portion, the upper ends of said inclined portions being secured together and bent to form a hook;

b. a tubular resilient member closed at one end thereof fitting over said hook ends;

c. an inverted elongated U-shaped member having a top center portion, a pair of downwardly extending legs and an interior surface of said center portion having a pair of parallel elongated groves therein, said lower portions inserted into said groves therein, said lower portions inserting into said groves; and

d. flexible flange members affixed perpendicularly onto said legs, said flange members extending inwardly and overlapping each other.

3,963,156

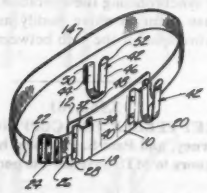
GUN REST CRADLE

Frederick W. Perrin, 6161 Engleman, Warren, Mich. 48091

Filed Apr. 1, 1974, Ser. No. 457,104

Int. Cl.² F41C 33/00

U.S. Cl. 224—1 R 1 Claim



1. A gun rest cradle adapted for support about the waist of a wearer, said cradle comprising a substantially rectangular central rigid plate member, a pliable dorsal strap, fastening means at each end of said strap, a pair of substantially U-shaped hook members, means for removably mounting said hook members on said plate member for receiving a stock of a gun in said hook members for supporting said gun at two separated engagement locations along the length of said gun stock, said detachable fastening means comprising a buckle fastened to an end of said plate member and means at the corresponding end of said strap for connection with the buckle, said means for removably mounting said hook members on said plate member comprising a pair of spaced apart gusset members affixed in substantially parallel relationship to said plate member proximate each end thereof, each of said gusset members being in the form of an elongated open U-shaped channel having a substantially flat bottom section and a pair of substantially parallel wall portions each provided with an outwardly extending flange portion for fastening to said plate member wherein one end of said dorsal strap is sandwiched between one of said flange portions and said plate member, said U-shaped hook members each being made of a substantially rigid strip of metal bent over in a generally U-shaped configuration defining a pair of spaced apart substantially parallel sidewalls joined together by a curvilinear section across one longitudinal end of each sidewall and wherein one of said sidewalls includes an integral projecting portion at its other longitudinal end bent substantially at 180° relative to said sidewall and adapted for hooking engagement over either of the open ends of said gusset members by inserting the projecting portion into the U-shaped channel of said gusset members wherein the longitudinal length of said U-shaped channel of said gusset members is at least as long as the longitudinal length of said projecting portion thereby preventing rotation of said hook members in said gusset members, whereby said hook members can be removably mounted in either end of said gusset members and whereby different sized hook members are attachable to said gusset members to accommodate different sized guns, the other sidewall of said hook members having an end portion bent at a diverging angle for facilitating the introduction of said gun stock between said sidewalls and wherein said U-shaped hook members are provided with a resilient and soft surface covering at the area in engagement with said gun stock so as to protect said gun stock when said gun is mounted in said gun rest cradle.

3,963,157

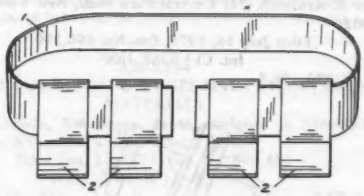
BALL BELT

Nancy Rosbottom Truax, 6708 Glenhurst St., Dallas, Tex. 75240, and Margaret Ann Rosbottom, 731 Pierremont Road, Shreveport, La. 71106

Filed Sept. 25, 1974, Ser. No. 509,104

Int. Cl.² A45C 11/00

U.S. Cl. 224—5 D 1 Claim



1. A ball belt to be worn around a users's waist or hips comprising:

a. a length of stretch fabric forming a waist encircling supporter band;

b. at least one holder having two flat loops of stretch fabric, said loops each forming adjacent, double openings having essentially parallel axes, one of said openings removably and adjustably receiving said supporter band, and the other of said openings resiliently and selectively receiving and supporting a ball.

3,963,158

COMBINED EXTENSIBLE CARRIER AND ELECTRICAL WIRE SHEATH

Alain Jean-Marie Clenet, Ventura, Calif., assignor to W. R. Grace & Co., New York, N.Y.

Filed Aug. 16, 1974, Ser. No. 498,044

Int. Cl.² B62J 7/04

U.S. Cl. 224—31 2 Claims

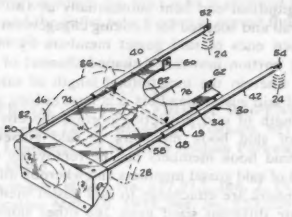
1. In combination with a motorcycle having a seat, the improvement of a carrier comprising:

a front frame section fastened to said motorcycle and lying at the rear of the seat;

a rear frame section positioned behind said front section and slideable forwardly and rearwardly toward and away from said front section;

at least one electric light mounted on said rear frame section for energization from wires leading from the motorcycle;

retainer means for retaining said rear frame means at forward and rearward positions with respect to said front frame section; and



sheet means of tough flexible material having a front portion attached to said front frame section and a rear portion attached to said rear frame section, whereby the sheet means provides a cargo supporting platform when the rear frame section is moved rearwardly and yet the sheet means enables the rear frame section to be moved forwardly to optimize motorcycle handling characteristics;

said flexible sheet means defining a flexible sheath, for holding said wires leading to said light at both said forward and rearward positions of said rear frame section.

3,963,159

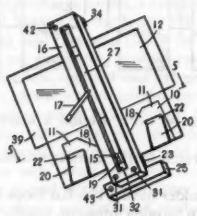
GLASS CUTTING APPARATUS

Lester S. Krulwich, 241 Central Park West, New York, N.Y. 10024

Filed July 16, 1975, Ser. No. 596,390

Int. Cl.² B26F *3/00*

U.S. Cl. 225—96.5 **10 Claims**



1. A glass cutting apparatus comprising two plates adjacent to each other and means attaching said plates to an extension piece so that each plate is allowed to swing up and back from the line formed by the adjacent plate edges, said extension piece having a front section with means mounting a bar thereon, said bar containing an elongated slot extending rearwardly from in front of said plates to substantially the opposite end of the bar, said plates being spaced from and opposing said bar and protruding beyond the sides of the bar with the adjacent edges of said plates being substantially parallel to said bar and said plates having means for releasably clamping a sheet of glass against said plates with the front end portion of said sheet of glass extending between said plates and said bar and with said bar opposing said sheet of glass along substantially the entire length of said sheet of glass, means exerting pressure under and on each plate when said sheet of glass is clamped, said pressure being insufficient to break the glass prior to scoring thereof, and means for scoring said sheet of glass with said bar slot as a guide, said means exerting pressure on said plates being then adapted to exert a severing force on said sheet of glass along the score line.

3,963,160

APPARATUS FOR PERFORMING TWO OR MORE OPERATIONS ON A CONTINUOUS WEB IN A SINGLE PASS

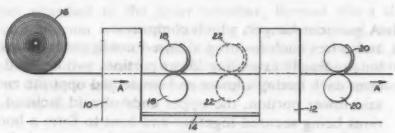
Thomas Desmond Bishop, Solihull, England, assignor to The Deritend Engineering Company Limited, Birmingham, England

Filed Nov. 12, 1974, Ser. No. 523,239

Claims priority, application United Kingdom, Dec. 12, 1973, 57470/73

Int. Cl.² B65H *17/42*

U.S. Cl. 226—115 **4 Claims**



1. Apparatus for treating web material comprising first and second pairs of treatment rolls, said pairs being spaced apart in the direction of travel of the web, each treatment roll pair including one roll having a treatment area which extends over only part of the circumference of the roll and serves, when in confronting relation to the other roll of the pair, to provide a nip by means of which the web is driven forwardly while it is contacted by the treatment area, said roll pairs being synchronized so that their treatment areas contact the web simultaneously, a first feed mechanism located adjacent to the entering side of the first roll pair, a second feed mechanism located adjacent to the entering side of the succeeding roll pair, each feed mechanism constituting means for decelerating the web upon each cessation of contact between the web and said treatment areas, moving the web in the reverse direction, and then accelerating it in the forward direction to synchronize the speed of the web with the linear speed of said treatment areas, and means for synchronizing the operation of said feed mechanisms to cause them to move bodily and maintain under tension the entire span of the web between said feed mechanisms.

3,963,161

SHEET FEEDER FOR CUPPING PRESS

Thomas D. Jerney, and Paul S. Petersen, both of Minnetonka, Minn., assignors to MTS Systems Corporation, Minneapolis, Minn.

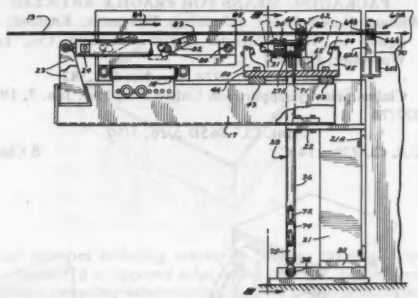
Filed Feb. 10, 1975, Ser. No. 548,612

Int. Cl.² B65H *17/36*

U.S. Cl. 226—150 **12 Claims**

7. A sheet feeder device for feeding thin sheet material into a work press or the like, comprising a first frame member, means to mount said first frame member adjacent an infeed side of a work press, means on said first frame member to support a sheet of material to be fed at a position spaced from the said work press, a second reciprocating frame mounted on said first frame member and positioned between said means to support a sheet of material and the work press, said reciprocating frame including clamp means to engage and hold edge portions of a sheet to be fed, means to reciprocate said reciprocating frame along a feed axis for a sheet of material so that said clamp means are moved back and forth in direction parallel to the feed axis, means to actuate said clamp means

to grip a sheet of material when the reciprocating frame is in a retracted position and to hold a sheet as the reciprocating frame is moved toward the work press to an infeed position, and said clamp means being actuated to release said sheet when the reciprocating frame reaches the infeed position and as the reciprocating frame is reciprocated back to its retracted position, and edge guide means for a sheet to be fed positioned



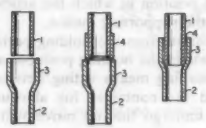
adjacent said means to support on a side of said reciprocating frame opposite from the work press so that a sheet being fed is pulled by said clamp means through said edge guide means, said second reciprocating frame including flexible supports attached to the first frame which permit said clamp means to move laterally of the feed axis under lateral forces exerted by a sheet of material being fed.

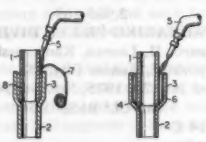
3,963,162

METHOD OF SOLDERING STAINLESS STEEL PIPES BY USING SOFT SOLDERS

Toshihiko Taguchi, Showa, and Takehiko Ito, Kamagaya, both of Japan, assignors to Senju Metal Industry Co. Ltd. and Nisshin Steel Co., Ltd., both of Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,663
Claims priority, application Japan, Aug. 13, 1973, 48-89991
Int. Cl.² B23K *31/02*
U.S. Cl. 228—134 **7 Claims**





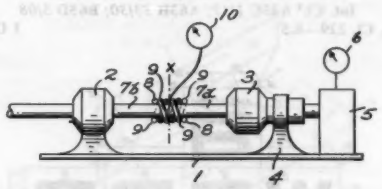
1. A method for joining stainless steel pipes by using soft solder the ythe steps of:
   - preparing a pipe joint having a diametral clearance of from 0.05 to 1.00 mm,
   - filling said clearance with paste solder, said paste solder comprising from 20 to 80% by weight of a flux composition and from 80 to 20% by weight of powder solder, and said flux composition comprising a flux component of a mixture comprising from 5 to 50% by weight of phosphoric acid (H_3PO_4) and from 95 to 50% by weight of ammonium dihydrogenphosphate ($NH_4H_2PO_4$) in a vehicle;
   - heating said pipe joint to melt said paste solder; and
   - feeding additional soft solder into said clearance immediately after said paste solder is molten by said heating.

3,963,163

METHOD FOR BONDING BODIES MADE OF METALLIC MATERIAL

Yoshiki Oshida, Yokohama, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1975, Ser. No. 540,413
Int. Cl.² B23K *13/00, 19/00*
U.S. Cl. 228—196 **10 Claims**



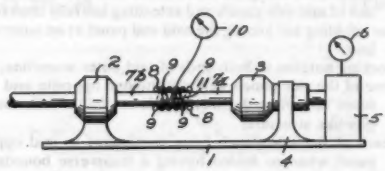
1. A method for bonding bodies made of metallic materials, wherein the steps comprise:
   - placing surfaces of portions of the metallic material to be bonded, in abutting relationship;
   - applying pressure to the metallic material sufficient to pressure bond the material with super-plastic flow at heated temperature;
   - simultaneously with the application of pressure, alternately heating and cooling the metallic material in the area where the bond is to be formed through a temperature range extending above and below the transformation temperature or temperatures of the metallic material being bonded; and
   - continuing said steps of applying pressure and alternately heating and cooling, for a time sufficient to form a permanent bond between the portions of metallic material.

3,963,164

METHOD FOR BONDING BODIES MADE OF METALLIC MATERIALS

Yoshiki Oshida, Yokohama, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1975, Ser. No. 549,412
Int. Cl.² B23K *13/00, 19/00*
U.S. Cl. 228—217 **8 Claims**



1. A method for bonding bodies made of metallic materials, wherein the steps comprise:
   - sandwiching a bonding insert material that can form a reducible atmosphere upon bonding, between surfaces of portions of the metallic material to be bonded;
   - applying pressure to the metallic material and the insert material sufficient to pressure bond the material with super-plastic flow at heated temperature;
   - simultaneously with the application of pressure, alternately heating and cooling the metallic material and the insert

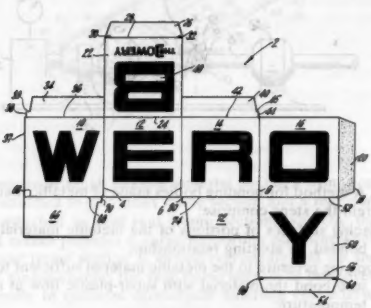
material in the area where the bond is to be formed through a temperature range extending above and below the transformation temperature or temperatures of the metallic metal being bonded; and

continuing said steps of applying pressure and alternately heating and cooling, for a time sufficient to form a permanent bond between the portions of metallic material.

3,963,165
SCORED BLANK TO BE FOLDED INTO DISPOSABLE SAVINGS BANK

Jan Hughes, 548 Riverside Drive, 3A, New York, N.Y. 10027

Filed Dec. 24, 1974, Ser. No. 536,246
Int. Cl.² A45C *1/12*; A63H *33/30*; B65D *5/08*
U.S. Cl. 229—8.5 **1 Claim**



1. A scored blank adapted to be folded into the form of a closed container suitable for use as a disposable bank comprising when unfolded an elongated blank body of uniform width between longitudinal boundaries scored transversely into a plurality of side panels each having longitudinal and transverse boundaries, the said blank being adapted upon folding along the transverse score lines to be joined in a box-like structure of predetermined peripheral configuration and dimensions;

an adherable tab protruding from the transverse boundary of a side panel at one extremity of the blank body;

adhesive for securing the said tab to the opposite extremity of the blank body to retain the side panels as so joined;

an end panel, conforming in its periphery to the peripheral configuration and dimensions of the said box-like structure, joining the elongated body at one of its longitudinal boundaries along an inner score line co-extensive with one of said side panels and extending laterally therefrom;

an infolding tab joining the said end panel at an outer score line;

locking notches at both ends of said outer score line;

one of the side panels being positioned opposite said inner score line when the side panels are folded into the said box-like structure;

each of the side panels lying contiguous to said opposite panel when so folded having a transverse boundary in engagement with said opposite panel and having a flap which joins the said contiguous side panel at a score line and which extends laterally from the elongated body in the same direction as the said end panel extends, and

a shoulder formed in each of said flaps in proximity to said opposite panel adapted to interlock with said notches to secure the end panel in closed position;

the said shoulder of each flap being recessed from alignment with the said boundary in engagement with said opposite panel to afford a spacing slot for the reception of said infolding tab between the shoulder and the inner surface of said opposite panel;

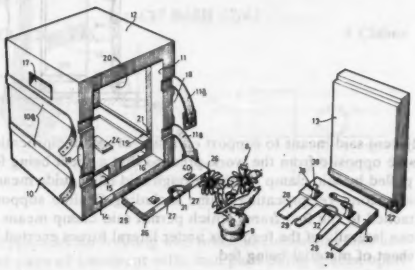
the blank having two such end panels extending laterally in opposite directions from the said blank body to form the top and bottom closing panels of the box-like structure; and

one of said panels being slotted for the reception of coins.

3,963,166
PACKAGING MEANS FOR FRAGILE ARTICLES

William Sutton Baker Skimming, Worcester, England, assignor to The Worcester Royal Porcelain Co., Ltd., Worcester, England

Filed Dec. 30, 1974, Ser. No. 537,382
Claims priority, application United Kingdom, Jan. 3, 1974, 327/74
Int. Cl.² B65D *5/16*, *5/50*
U.S. Cl. 229—14 C **8 Claims**



1. Packaging means for containing at least one fragile article, such packaging means comprising:

a. a container having walls of a shock absorbing material,

b. supporting means in the interior of the container for positionally controlling the article to maintain such article in spaced relation from the walls of the container, such supporting means incorporating holding parts movable relatively to each other between a holding position in which such parts engage with a relatively robust part of the article concerned to hold the article in position, and a releasing position in which the article is freely removable from the supporting means,

c. means separate from the holding parts for retaining the holding parts in the holding position, and

d. shock absorbing means acting between the supporting means and the container for allowing the supporting means to undergo limited movement relatively to the container.

3,963,167
PACKAGING FILLER DIVIDER

Larry J. Newgaard, II, Lenexa, Kans., assignor to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed Jan. 23, 1975, Ser. No. 543,441
Int. Cl.² B65D *5/56*
U.S. Cl. 229—14 C **5 Claims**

1. In combination:

a merchandise container having a bottom wall and upstanding sidewalls for defining a merchandise-receiving space within the container;

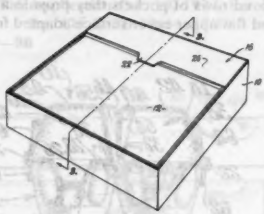
a supply of merchandise positioned within said space and of lesser volume than the latter, one marginal edge of said merchandise and the adjacent, opposed sidewall of said container defining a filler-receiving space; and

a filler of dimensions to substantially fill said filler-receiving space positioned within the latter, said filler including

an elongated, hollow body having spaced, opposed, substantially parallel and planar sidewalls respectively adjacent said one marginal edge of the merchandise and said op-

posed container sidewall for preventing substantial shifting of said merchandise within the container; and

an elongated, substantially planar reinforcing member of a length substantially equal to said sidewalls and positioned within said body in substantially spanning and perpendicular relationship to the body sidewalls,



said member including respective, unitary marginal flaps connected to opposed sides of the member, each of said flaps extending substantially the entire length of the member and adjacent body sidewall and being connected to the latter.

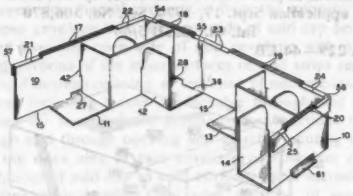
said marginal flaps extending in opposite directions relative to said reinforcing member for rigidifying said filler.

3,963,168

MULTICELL CARTON INSERT

Carlos M. Frum, Chicago, Ill., assignor to Consolidated Packaging Corporation, Chicago, Ill.

Filed Feb. 28, 1975, Ser. No. 553,980
Int. Cl.² B65D *5/48*
U.S. Cl. 229—28 R **10 Claims**



1. A one-piece multicell reinforced carton insert comprising:

an exterior boundary side wall,

a plurality of cell segments integrally formed with said exterior boundary side wall and each being attached to the bottom edge of the side wall at spaced intervals therealong,

each cell segment being folded to form at least a bottom and two interior side walls of two adjacent cells, and

each cell segment being interlockable with at least one another adjacent cell segment to form a total reinforced structure.

3,963,169

PARTITION ARRANGEMENT

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 1, 1975, Ser. No. 601,025
Int. Cl.² B65D *5/48*
U.S. Cl. 229—28 R **4 Claims**

1. In a four-cell partition arrangement formed from a unitary blank of foldable paperboard, the combination of:

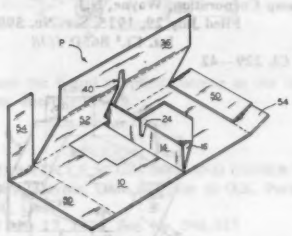
a. a generally rectangular outer bottom panel;

b. a transverse partition member cut from material of said outer bottom panel and including:

i. a first vertical element;

ii. a generally triangular gusset element foldably connected at one edge to a lower edge of said first vertical element on one fold line extending transversely of said outer bottom panel, foldably connected along another edge to said outer bottom panel along another fold line which diverges from said one fold line at an angle of less than 90°, and being disposed in face-to-face engagement with the upper surface of said outer bottom panel;

c. a longitudinal partition member including:



i. a second vertical element;

ii. an inner bottom panel foldably connected at one side edge to a side edge of said outer bottom panel, foldably connected at another side edge to a lower edge of said second vertical element, and being disposed in face-to-face engagement with the upper surface of said outer bottom panel to cover at least a portion of the opening formed by the removal of the material for said transverse partition member;

iii. said second vertical element and said inner bottom panel having aligned slots for receiving a portion of said first vertical element;

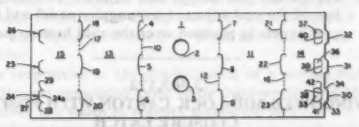
d. said first vertical element having a slot extending downwardly from its upper edge for receiving a portion of said second vertical element to provide interlocking engagement therebetween.

3,963,170

PANEL INTERLOCKING MEANS AND BLANK UTILIZING SAID MEANS

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 29, 1974, Ser. No. 528,498
Int. Cl.² B65D *65/12, 65/22*
U.S. Cl. 229—40 **13 Claims**



1. An arrangement for interlocking a pair of panels in overlapping relation, said arrangement comprising a locking slit formed in one of said panels and having a pair of spaced angularly related locking edges which diverge from a base slit, a locking tab struck from a part of the other of said panels and having a pair of spaced angularly related side edge portions and being secured to said other panel along a hinge line which is disposed in substantial coincidence with said base slit, and part of said other panel from which said locking tab is struck being disposed in a direction from said base and hinge lines which is opposite to that in which said locking edges extend,

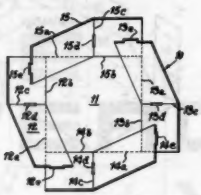
said locking tab being folded out of the plane of said other panel and being disposed within said locking slit with its angularly related side edge portions in locking engagement respectively with said angularly related locking edges of said locking slit, and said locking edges and said side edge portions being secured in angular locking relation to each other by the inherent bias urging said locking tab toward coplanar relationship with said other panel.

3,963,171

CUSHION PARTITION TRAY FOR INSERTION INTO A BOX

La Vern G. Lindsay, Petersburg, Mich., assignor to Union Camp Corporation, Wayne, N.J.

Filed July 29, 1975, Ser. No. 599,992
Int. Cl.² B65D 5/48
U.S. Cl. 229—42 6 Claims



1. A one sheet blank adapted for folding into a partition tray having center section of rhomboid shape surrounded by smaller rectangular sections comprising:

a generally rectangular bottom panel; and

four rectangular panels forming a frame around the said bottom panel,

each of said rectangular panels having

a. a width equal to the desired height of the sections;

b. a first hinge score line normal to the longitudinal edges of the said rectangular panel dividing the said panel into first and second portions;

c. a slot cut into the said first hinge score line;

d. the first portion thereof connected to a different but corresponding corner of the said bottom panel along a second hinge score line normal to the first hinge score line and extending from the said corner of the said bottom panel to the end of the first hinge score line adjacent the said bottom panel;

e. the said second portion thereof of such length that the free end thereof will extend when the said rectangular panels are folded upward and over the said bottom panel, to the adjacent first hinge score line of the adjacent rectangular panel; and

f. a tongue on the said free end adapted and positioned to engage the said slot in said adjacent first hinge score line of the said adjacent rectangular panel and lock the said panels in position over the said bottom panel.

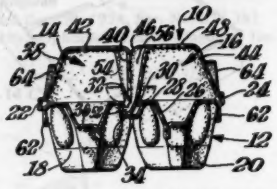
3,963,172

WINDOWED MID-LOCK CARTON WITH POSITIVE CLOSURE LATCH

Henry A. Holzwarth, Bayside, and John D. Wark, Freeport, both of N.Y., assignors to Keyes Fibre Company, Waterville, Maine

Filed Mar. 24, 1975, Ser. No. 561,257
Int. Cl.² B65D 1/36, 43/16, 85/32
U.S. Cl. 229—44 EC 7 Claims

1. A molded carton for packaging articles such as eggs comprising a bottom section having a first row and a second row of downwardly dished article receiving pockets with upwardly tapering posts between the rows of pockets, a first cover section hingedly connected to one side of the bottom section for rotation between an open position and a closed position overlying the first row of pockets, a second cover section hingedly connected to the other side of the bottom section for rotation between an open position and a closed position overlying the second row of pockets, the first and second cover sections being dimensioned so that when they are in the open position the empty carton can be nested with other like empty cartons in a stack for shipment and storage, and so that when they are in the closed position overlying the first and second rows of pockets they provide a substantially uninterrupted flat upper cover surface adapted for the display



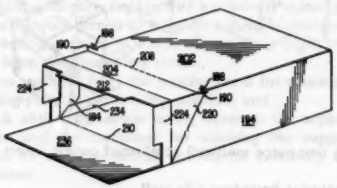
of advertising and content information, and means for locking the cover sections to the bottom section in the closed position characterized by a male locking projection on each cover section which project upwardly and outwardly when the cover sections are in the open position and which project downwardly and inwardly when the cover sections are in the closed position for engagement with female locking ledges formed by the upper edges of apertures located partly through the base and partly through one side of a valley formed in the tops of the posts in parallel alignment with the rows of pockets.

3,963,173

RECLOSABLE CONTAINERS AND BLANKS THEREFOR

Orison W. Stone, Rte. 17, New Haven, Vt. 05472

Continuation-in-part of Ser. No. 458,188, April 5, 1974. This application Sept. 17, 1974, Ser. No. 506,870
Int. Cl.² B65D 5/66
U.S. Cl. 229—44 CB 7 Claims



1. A paperboard blank for a paperboard container comprising:

a front panel which includes a detachable portion and a front panel top flap integrally connected to said detachable portion at the upper extremity of said front panel;

a pair of side panels, each side panel being integrally connected to said front panel and including a detachable portion at the upper extremity of said side panel;

a back panel integrally connected to one of said side panels;

a top panel integrally connected to said back panel at the upper extremity thereof;

a pair of side panel top flaps, each side panel top flap integrally connected to the detachable portion of each side panel, being positioned at the upper extremity thereof and having a height substantially less than the top panel; and

a collar disposed adjacent said front panel top flap, including a pair of tabs, and a finger access cut out defined by a single cut line separating the collar from the front panel

top flap, each tab being hingedly connected to one of said side flaps.

3,963,174

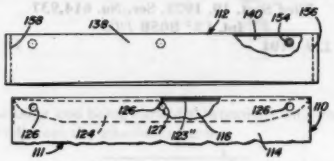
PERMANENT ENVELOPE

Rose T. de Lyra, 9280 Harding Ave., Surfside, Fla. 33154

Continuation-in-part of Ser. No. 363,747, May 5, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,932

Int. Cl.² B65D *27/14, 27/34*

U.S. Cl. 229—80 13 Claims



1. A permanent type envelope including front and rear panels and having corresponding opposite side and opposite end edge portions, first means securing said panels together along corresponding end edge portions and one pair of corresponding side edge portions of said panels with the other corresponding side edge portions of said panels defining an opening therebetween and an open side of said envelope, a closure cap including front and rear strips of a length greater than said other pair of edge portions and having corresponding opposite side and opposite end marginal portions, second means securing said strips together along corresponding end marginal portions thereof and along one pair of corresponding side marginal portions with the other side marginal portions of said strips defining an open side of said cap, said envelope defining at least one through opening formed therein adjacent said open side thereof and spaced from the opposite ends of the open envelope side, the open side of said cap being telescoped over the open side of said envelope with predetermined portions of the inner surfaces of said strips registered with said through opening, at least one of said predetermined portions including means displaceable through said through opening for securing said predetermined portions together through said through opening and thereby securing said cap over the open side of said envelope independent of other attachment of said cap to said envelope, said second means including corresponding end edge portions of said strips joined together and to the adjacent portions of said strips along transversely extending weakened zones thereof for removal of said corresponding end edge portions along said weakened zones, the spacing between opposite end weakened zones of said strip being slightly greater than the distance between the remote end edge portions of said front and rear panels.

3,963,175

FEEDCONE WITH ACCELERATOR VANES FOR IMPERFORATE BASKET

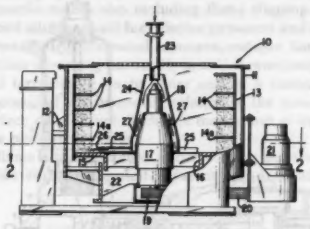
Edward A. Daubman, and John W. Sherlock, both of East Moline, Ill., assignors to Ametek, Inc., New York, N.Y.

Filed July 31, 1974, Ser. No. 493,331

Int. Cl.² B04B *11/06*

U.S. Cl. 233—29 3 Claims

1. In a centrifugal, the combination of an imperforate basket mounted for rotation about a vertical axis and having a centrally disposed opening therein, a plurality of horizontal baffles on the inner wall surface of said basket, a plurality of substantially radially extending ribs for supporting the bottom wall of the basket, a feedcone mounted within said basket along the rotary axis thereof, and a plurality of discharge tubes extending radially from the lower portion of said feedcone across said opening above and generally aligned with said ribs, and a plurality of vertically extending vanes within said feedcone to accelerate the liquid supplied thereto as the liquid travels toward the discharge tubes.



3,963,176

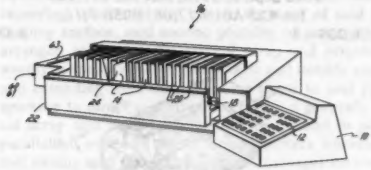
COMBINED ARTICLE SELECTOR AND CODER

Richard C. O'Brien, Dayton, Ohio, assignor to O.K. Partnership, Cincinnati, Ohio

Filed July 17, 1975, Ser. No. 596,915

Int. Cl.² G06K *1/08*

U.S. Cl. 234—48 14 Claims



10. A coder for selectively notching the teeth of articles having a sorting edge with alternate registration notches and code notchable teeth, said coder being combined with a selector for selecting such articles from a plurality of such articles supported with their respective sorting edges aligned, said selector being of the type comprising a platen for supporting said articles and having a plurality of spaced parallel slots, a plurality of sorting bars, one of said sorting bars being disposed within each of said slots, and means for selectively displacing said sorting bars in a horizontal and vertical direction, said coder comprising:

a housing including a card-receiving slot for receiving a toothed article to be encoded;

stop means limiting the insertion of said article within said slot;

a knife blade associated with each of said sorting bars, each of said knife blades being movable transversely of said slot and being positioned to sever one tooth from said article;

means responsive to the displacement of a sorting bar for shifting an associated knife blade transversely of said slot to sever the tooth in registry therewith; and

means for returning said knife blades to a retracted position.

3,963,177

THERMOSTATIC CONTROL VALVE FOR A ONE-PIPE STEAM SYSTEM

Jamie Frank, Roslyn, N.Y., assignor to Flair Manufacturing Corporation, Hauppauge, Long Island City, N.Y.

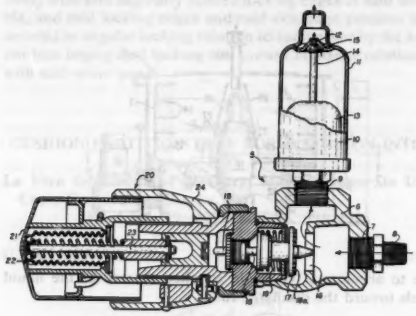
Filed Mar. 12, 1975, Ser. No. 557,727

Int. Cl.² F28F *27/00*

U.S. Cl. 236—37 6 Claims

1. A thermostatic control valve for a one-pipe steam system comprising a vent valve provided with a fitting for connection

to a radiator of a one-pipe steam system, means defining a flow passage from said fitting into said vent valve, and a temperature controlled valve for closing said flow passage at a pre-set ambient temperature.

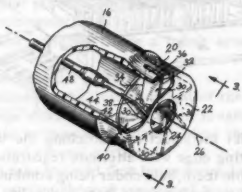


3,963,178

SPRAYER NOZZLE

Dean E. Collins, Lowell, Mich., assignor to Root-Lowell Manufacturing Co., Lowell, Mich.

Filed Sept. 8, 1975, Ser. No. 611,222
Int. Cl.² A01N *17/08*; B05B *7/10*
U.S. Cl. 239—8 **6 Claims**



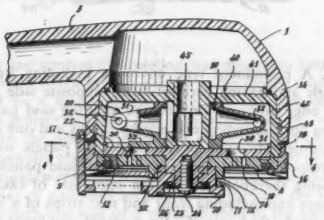
1. A nozzle in combination with a sprayer having a liquid reservoir and a forced air flow source, said nozzle comprising a housing having an annular side wall formed by an axis and having an end wall, said end wall having a circular opening therein generally concentric with said housing axis, a plurality of vane means each having an outer longitudinal edge and an inner longitudinal edge extending between first and second end edges, said vane means having their first end edges positioned adjacent said side wall at generally equal angularly spaced locations about said housing axis, said vane means having their second end edges projecting partially across said end wall opening to expose portions of said vane means outer longitudinal edges, said vane means second end edges terminating at generally equal angularly spaced locations about said housing axis, each vane means second end edge being offset from a radial line extending between said housing axis and the first end edge of the vane means, a disk spaced from said end wall and overlying said vane means at their inner longitudinal edges, said disk having an outer circumferential edge spaced from said housing side wall and a center opening generally aligned with said housing axis, a liquid conduit means connected to said liquid reservoir and extending into said disk opening for directing spray liquid to said housing, an air hose means enclosing said conduit means and having one end engaging said housing side wall and another end associated with said air flow source for directing air into said housing with said air passing between said disk circumferential edge and housing side wall and along said vane means and out said housing end wall opening, said vane means for imparting a whirling motion to said air as it exits said housing end wall opening to cause liquid emitted from said conduit means to strike said vane means and be blown from the vane means at their second end edges and exposed portions of their outer longitudinal edges through said housing end wall opening in atomized form.

3,963,179

SHOWER HEAD ADAPTED TO PRODUCE STEADY OR PULSATING FLOWS

Patrick M. Tomaro, Maplewood, N.J., assignor to Continental Hair Products, Inc., Edison, N.J.

Filed Sept. 19, 1975, Ser. No. 614,937
Int. Cl.² B05B *1/08*
U.S. Cl. 239—101 **18 Claims**



7. A shower head capable of producing a pulsed output, if desired, said shower head including

a housing having a water inlet, an outer cover forming part of said housing and having holes therein forming a water outlet,

the holes in said outer cover forming two sets, one set for pulsed and one set for steady-stream water,

a plenum chamber within said housing to receive all the water entering said inlet and to dispense all the water leaving said water outlet, said chamber having an inlet opening and an outlet opening,

a spinner within said chamber to periodically close said outlet opening to cause pulsation in said water, said spinner being actuated by water entering said inlet opening,

means directing said pulsed water to at least some of the holes in said outer cover,

and means for removing the pulses from the water going to one of said sets,

whereby all of the water used by said shower head passes through said plenum chamber and all is pulsed as it leaves said chamber.

3,963,180

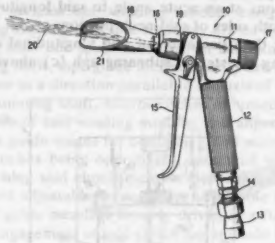
AIRLESS GUN NOZZLE GUARD

Josef Wagner, Friedrichshafen, Germany, assignor to Spray Tech Corporation, Minneapolis, Minn.

Filed Aug. 11, 1975, Ser. No. 603,676
Int. Cl.² B05B *1/28*, *15/04*
U.S. Cl. 239—288.5 **10 Claims**

1. a safety nozzle guard for airless spray pistols comprising: in combination, a spray pistol having a nozzle outlet producing a fanlike spray pattern, a guard, and means for attaching the guard to the pistol adjacent the nozzle, the guard having an attachment end having a substantially circular cross-section attachable to the spray pistol radially of the nozzle outlet and discharge end having a substantially elongated cross-section between top, bottom and two side walls, the discharge end spaced from the attachment end by continuous walls which

are dimensioned similarly to the spray pattern and which increases in internal cross-section downstream of the outlet,



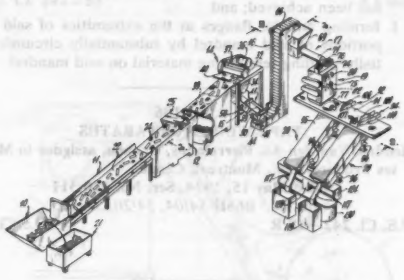
the discharge end being curved substantially on a radius generated adjacent the attachment end.

3,963,181

FOOD RECLAIMING SYSTEM

Joseph T. Deloy, Lyndhurst, N.J., and Grant J. Selch, Schenectady, N.Y., assignors to Nabisco, Inc., East Hanover, N.J.

Filed May 19, 1975, Ser. No. 578,616
Int. Cl.² B02C *23/38*
U.S. Cl. 241—76 **10 Claims**



1. A system for producing comminuted edible product by reclaiming baked products in rejected packages comprising in combination means at a first station for receiving the rejected packages, conveyor means feeding the rejected packages to a second station, means at said second station for shredding the packaging materials and dividing the product into pieces, aspirating means for separating unencumbered wrapper shreds from product pieces and wrapper sections encumbered by product pieces, means for transporting the product pieces and encumbered wrapper sections to a third station, means at said third station for comminuting all of the product pieces without cutting the wrapper sections, and means for separating the comminuted product from the wrapper sections.

3,963,182

BURNER

Roy M. Rulseh, Milwaukee, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Continuation of Ser. No. 317,211, Dec. 21, 1972, abandoned. This application June 24, 1974, Ser. No. 481,999
Int. Cl.² B05B *7/10*
U.S. Cl. 239—404 **29 Claims**

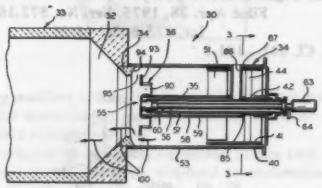
28. Apparatus for burning fuel comprising:

means defining a combustion zone having an inlet, nozzle means including fuel discharge means for injecting a fuel into said combustion zone, the movement of fuel into said zone defining a downstream direction, said fuel discharge means including a generally conical outside surface and a fuel receiving space,

means for delivering combustion supporting gas to said fuel receiving space,

said nozzle means also including flame shaping means disposed adjacent said fuel discharge means and including a generally frusto-conical, concave, outside flame shaping surface diverging outwardly in said downstream direction and terminating on its inner end in a central aperture disposed in a surrounding relation to the conical outside surface of said fuel discharge means and at its outer end in a peripheral margin,

said flame shaping means also including generally conical inside surface disposed adjacent and generally complementary to said conical outside surface of said fuel discharge means,



a plurality of passages formed in one of said inside and outside conical surfaces and extending between said fuel receiving space and the center aperture of said flame shaping surface, said second plurality of passages being arranged in a generally conical array and oriented inwardly in the direction of said inside and outside surfaces and extending from said receiving space to said central aperture to direct said atomized fuel in a generally conical array and closely spaced relative to and in general parallelism with said flame shaping surface whereby the fuel exiting said second plurality of passages moves outwardly along said flame shaping surface whereby said fuel is shaped into a fuel rich core stream.

3,963,183

RESHARPENABLE RECUTTER SCREEN FOR FORAGE HARVESTER

Earl W. Paulsen, Round Lake, Minn., assignor to Leo M. Ling, Worthington, Minn., a part interest

Continuation-in-part of Ser. No. 278,736, Aug. 8, 1972, abandoned. This application Nov. 1, 1974, Ser. No. 514,559
Int. Cl.² B02C *18/06*
U.S. Cl. 241—88.4 **8 Claims**

1. For use in a forage harvester including a rotating cutter carrying blades; a recutter screen comprising an upper flange and a lower base member joined together by substantially arcuate bars extending between said flange and said base member, a series of pieces extending between said bars and spaced from said flange and base member, said bars each having an inner surface adjacent to the path of the blades on

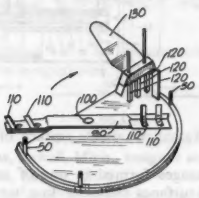
the rotating cutter, said pieces being fixed between said bars, and having inner surfaces coincident with the inner surface of said bars, said pieces being fixed to the bars so that each of the inner surfaces of said pieces intersects another adjacent surface of said piece to form an acute-angled, resharpenable cutting edge adjacent the path described by said blades on the rotating cutter, said cutting edge thereby lying in the plane of the inner surfaces of said bars.

3,963,184

DEVICE FOR CONVERTING A CONVENTIONAL LAWN MOWER TO A LEAF SHREDDER

Helmut Grimm, Mountainside, N.J., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Apr. 28, 1975, Ser. No. 572,162
Int. Cl.² B02C *18/10*
U.S. Cl. 241—101.1 **4 Claims**



1. A detachable device for converting a conventional motorized lawn mower to a leaf shredder, comprising:

a generally flat plate with a periphery taking the shape of a circle truncated by a non-diametrical chord, the plate being detachably securable to the bottom of a conventional lawn mower with the straight portion of the periphery extending transversely across the bottom, so as to expose the rear portion of the bottom of the mower;

an altered mower blade secured at its center to the shaft of the lawn mower and rotating in a plane parallel to the plate;

two like pairs of like fixed blades, each pair disposed at a corresponding end of the mower blade with the pairs being symmetrically disposed about the center of the blade, and with each fixed blade extending upwardly and rearwardly from its point of attachment to the mower blade; and

three like, spaced, straight, fixed fingers suspended above the plate and extending downwardly theretowards, in a manner that the rotating blade can carry each pair of symmetrically mounted blades between the fingers through the spaces therebetween and to shred leaves caught between the fingers and symmetrically mounted blades.

3,963,185

FILAMENT WINDING METHOD

Robert W. Quirk, Los Angeles, Calif., assignor to Hills-McCanna Company, Carpentersville, Ill.

Division of Ser. No. 207,745, Dec. 14, 1971, abandoned, and a continuation-in-part of Ser. No. 108,321, Jan. 21, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,358
Int. Cl. B65H *81/08*
U.S. Cl. 242—7.21 **2 Claims**

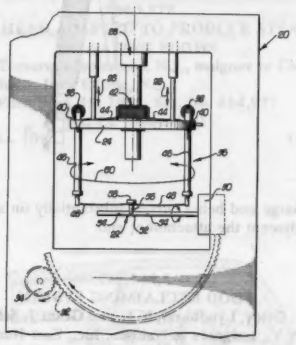
1. A method of winding reinforcing material on a T-shaped mandrel which includes a body having longitudinally spaced end portions providing a longitudinal axis and having a laterally extending neck portion, including the steps of:

a. winding reinforcing material substantially circumferentially around said neck portion;

b. winding reinforcing material substantially circumferentially around each of said end portions while continuously rotating said body through a plurality of revolutions about said longitudinal axis;

c. winding reinforcing material around said body and said end portions at an acute angle to said longitudinal axis and on both sides of said neck portion;

d. changing the orientation of said longitudinal axis while performing the step of subparagraph (c) above so as to



vary said acute angle of said reinforcing material to said longitudinal axis;

e. repeating the foregoing steps until the desired thickness has been achieved; and

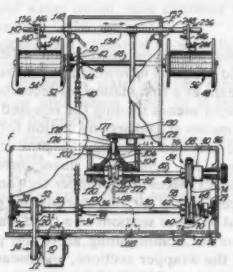
f. forming annular flanges at the extremities of said end portions of said mandrel by substantially circumferentially winding reinforcing material on said mandrel.

3,963,186

TAPE WINDER APPARATUS

Hendrik Van den Aa, Pierrefonds, Canada, assignor to Movatex Products Ltd., Montreal, Canada

Filed May 15, 1974, Ser. No. 470,311
Int. Cl.² B65H *54/04*, *54/20*, *54/30*
U.S. Cl. 242—18 R **5 Claims**



1. An apparatus suitable for helically winding a tape, comprising a drive module, said drive module comprising drive means, a first shaft rotatably driven by said drive means, a second shaft, a variable pitch pulley interconnecting said first and second shafts, means on said second shaft for varying the speed at which said second shaft is driven relative to said first shaft, a clutch member mounted on said second shaft and rotatably driven thereby, said clutch member having at least one lug on each side thereof, a pair of bevel gears mounted on said second shaft on either side of said clutch member, said pair of bevel gears each having at least one lug on the sides thereof for engagement with the corresponding lug on said clutch member, whereby said clutch member can rotatably drive one of said bevel gears, means for switching said clutch

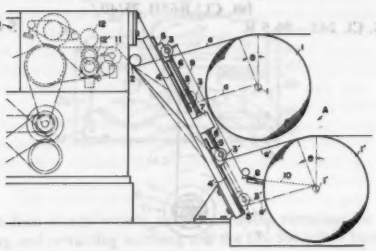
member to selectively drive one of said bevel gears through engagement of respective lugs, a third bevel gear operatively associated with said pair of bevel gears and being driven thereby, at least one winding module comprising a spool mounting shaft directly and rotatably driven by said first drive shaft, at least one spool mounted on each end of said spool mounting shaft, tape guide means linearly driven by said third bevel gear in a direction parallel to the axis of rotation of said spool mounting shaft, microswitches mounted on either side of a frame of said winding module, and adjustable means on said tape guide means for contacting said microswitches, said microswitches being operatively associated with said means for switching said clutch member between said pair of bevel gears, said adjustable means being adjustable such that when the tape guide means is linearly driven in a first direction by mating engagement of said clutch lug and said lug on said first bevel gear and said microswitch is contacted to reverse the direction of travel of said tape guide means, said clutch means, after being switched by said switching means, rotates through substantially 360° before the lug on said clutch means engages the mating lug on said second bevel gear.

3,963,187

WRINKLE-PROOF MECHANISM FOR PAPER ROLL SUPPLY

Tadao Ohi, No. 315, Miyashita, Fuji, Shizuoka, Japan

Filed May 22, 1974, Ser. No. 472,147
Int. Cl.² B65H *19/04, 35/02*
U.S. Cl. 242—55 **6 Claims**



1. A wrinkle-proof apparatus for supplying strips of paper from any of a plurality of paper rolls to a cutter, comprising:

a. a plurality of paper rolls arranged linearly in upper and lower vertical stages, each stage having a foremost paper roll near the cutter;

b. at least one paper strip fed from at least one roll in each stage, said paper strip being guided linearly over the paper rolls between the foremost paper roll and the paper roll feeding the paper strip, said strip fed from each stage being guided only along rollers of the same stage;

c. a movable roller means between the cutter and the upper and lower stage foremost rolls for deflecting the paper strips and causing said paper strips to embrace said foremost rolls over a predetermined embracing angle;

d. detecting means responsive to a change in the diameter of one of the foremost paper rolls; and

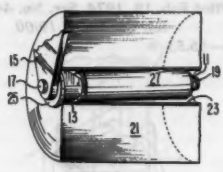
e. movement means activated by said detecting means for causing said movable roller means to change position in correspondence with said diameter change of one of the foremost paper rolls to maintain said embracing angle substantially constant.

3,963,188

LISTING MACHINE ROLL HOLDER

Hilliard R. DiVeto, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 6, 1974, Ser. No. 530,419
Int. Cl.² B65H *19/00, 49/00*
U.S. Cl. 242—55.2 **7 Claims**



1. A listing machine roll holder for multi-tape lister printers or the like for supporting a paper roll having a hollow core, said roll holder comprising:

a spindle adapted to be rigidly supported at one end;

a cylindrical spring flotatably disposed to encompass the spindle at said one end thereof;

confinement means for axially restricting said spring to the proximity of said one end of said spindle;

compression means integrally formed on said spring for compressing said spring by cooperative sliding frictional engagement of said compression means with the inside surface of a core of a roll as the roll is axially moved over said spindle from said other end thereof; and

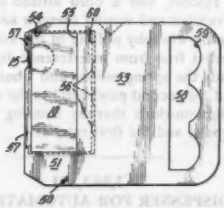
guide means integrally formed on said spring for guiding the core of the roll into frictional engagement with said compression means.

3,963,189

MINIATURE TAPE CARTRIDGE AND ADAPTOR

Andrew Peter Sharp, 5 Dufresne Court, Penthouse No. 4, Don Mills, Ontario, Canada

Filed June 4, 1974, Ser. No. 476,329
Int. Cl. G11B *23/10*
U.S. Cl. 242—55.19 A **7 Claims**



1. A miniature tape cartridge comprising a substantially rectangular housing for carrying an endless recording tape therein, said housing having a front end with at least one opening for access to part of said recording tape entrained therein past said opening for engagement of said tape with an external drive source for displacing said tape at a predetermined speed and to permit an external detection means to contact and detect information signals recorded on said tape, a substantially rectangular projection portion projecting concentrically from the outer periphery of said front end of said cartridge to define a recess having a flat alignment wall about said projection portion constituting an alignment means, said alignment wall lying in a plane substantially parallel to an axis extending widthwide in the plane of said tape, said alignment means locating said cartridge in a predetermined position within an adaptor housing whereby said adaptor housing will

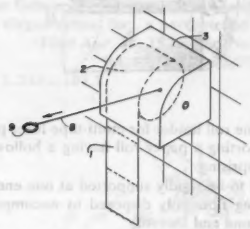
position said tape in a predetermined plane with respect to said external detection means.

3,963,190

TISSUE DISPENSING DEVICE FOR A ROLL OF TISSUE

Devon S. Wilson, Phoenix, Ariz., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 19, 1974, Ser. No. 443,358
Int. Cl.² B65H *19/00*
U.S. Cl. 242—55.53 **2 Claims**



1. A tissue dispensing device for a roll of tissue, said tissue dispensing device comprising

a housing having a slot formed therethrough;

a tissue-supporting spool rotatably mounted in the housing and supporting a roll of tissue therein for rotation therewith; and

spool rotating means affixed to the spool and extending out of the housing for rotating the spool to pass tissue through the slot of the housing, the spool rotating means comprising a first ratchet of predetermined diameter coaxially affixed to the spool and a first pawl affixed to the housing for permitting rotation of the first ratchet in one direction only, a second ratchet having a smaller diameter than the predetermined diameter mounted substantially coaxially with the spool independently therefrom in adjacent relation with the first ratchet, a second pawl affixed to the first ratchet in operative engagement with the second ratchet, spring means affixed to the housing and to the second ratchet, and a cord affixed at one end to the second ratchet and wound thereon and extending out of the housing whereby pulling of the cord rotates the second ratchet free from interference by the second pawl and winds the spring means and when the spring means is wound the second pawl catches the second ratchet and the spring unwinds thereby rotating the spool via the second pawl and the first ratchet.

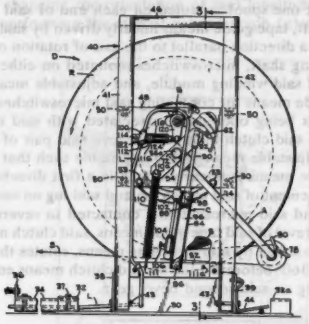
3,963,191

STRAP DISPENSER FOR AUTOMATIC STRAPPING MACHINE

George F. Goodley, Media, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 16, 1975, Ser. No. 569,324
Int. Cl.² B65H *25/22, 75/00*
U.S. Cl. 242—75.43 **6 Claims**

1. A strap dispenser for a strapping machine which machine has a strap feed mechanism for feeding strap around an article and for thereafter tensioning the strap around the article, said dispenser being of the type comprising a frame, a strap reel, a dancer arm pivoted on the frame for guiding strap from said reel to the strap feed and tensioning mechanism and a brake for the reel; the improvement comprising a pneumatic piston and cylinder assembly connected between said dispenser frame and said dancer arm for retracting said dancer arm when air under pressure is applied to said assembly, air line means for supplying air under pressure to said piston and cylinder assembly before said strapping machine feed mechanism starts feeding strap, means for connecting said air line means to exhaust when said strapping machine starts feeding strap and pulls strap from the reel while advancing said dancer arm, a throttle valve for bleeding said piston and cylinder



assembly to exhaust while said dancer arm is being advanced, and control means for applying said reel brake when air under pressure is directed to said piston and cylinder assembly, said brake control means being independent of dancer arm position.

3,963,192

TETHERING DEVICE KIT

Walter H. Haupt, 604 Wayne Road, Kenton Hills, Covington, Ky. 41011

Filed Apr. 10, 1975, Ser. No. 566,807
Int. Cl.² B65H *75/40*
U.S. Cl. 242—86.5 R **5 Claims**

1. A tethering kit for use with self-propelled machines, said kit being connectable with a tire rim having a center flange and lug holes, said kit comprising

a turret head that includes

at least one winding stake fixed in place on and extending upwardly from a base plate, said winding stake being of a length sufficient to extend outwardly beyond the plane of one side edge of said rim when said turret head and said rim are connected,

mounting means adapted through said lug holes to connect said base plate and said rim in fixed relation, said mounting means including at least two slots formed in said base plate, said slots being disposed radially relative to the center axis of said turret head, and bolt means adapted to pass through said base plate's slots and said rim's lug holes,

a first ground stake fixed to said base plate, said first ground stake being located at the center axis of said turret head and being coaxially oriented with said rim when said base plate and said rim are connected, and said first ground stake being of a length sufficient to extend beyond the plane of the other side edge of said rim when said base plate and said rim are connected, and

a bearing element located at the center axis of said turret head, said first ground stake being hollow at the upper end thereof to form said turret head bearing element,

a tether cord fixed at one end to said winding stake, said tether cord being adapted to connect with a self-propelled machine at the other end, and

a detachable handle having an end portion in the form of a bearing element, said handle bearing element being rotatably interfitted with said turret head bearing element during transfer of said rim from one location to another, and said handle bearing element being removed from said turret head bearing element after transfer of said rim from one use location to another,

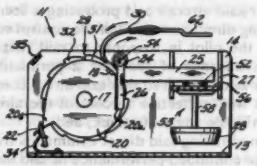
said rim being lifted by said handle from a substantially horizontal use position to a substantially vertical transfer position after said handle bearing element is rotatably interfitted with said turret head bearing element, and said rim being thereafter rolled to a new use location, thereby converting the stationary base to a movable winding reel so as to rewind said tether cord upon said winding stake.

3,963,193

FACE CLUTCH VEHICLE SENSITIVE INERTIAL RETRACTORS

Wallace Carson Higbee, Romeo, and Ronald Albert Willey, Port Huron, both of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 12, 1974, Ser. No. 460,336
Int. Cl.² A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **7 Claims**



1. A face clutch vehicle sensitive inertial retractor for dispensing and retracting webbing and the like for safety harness usage comprising:

a frame supporting a drum with webbing and drum retracting motor, said drum on a shaft and said shaft driven by said motor and said drum including at least one ratchet face, a pawl tiltably supported by said frame and a spring urging said pawl toward locking engagement with said ratchet as webbing is withdrawn from said drum;

a mass movable omnidirectionally on application of inertial forces and supported by said frame;

a lever normally engaged with said mass and movable by said mass upon inertial displacement of said mass;

a finger element extending from said lever and movable as said lever is moved;

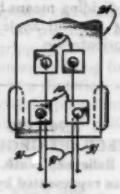
a face clutch plate in coaxial relation with said drum and frictionally driven thereby, said clutch plate having a step-like notch in the periphery thereof engaged by said finger, a cam-like integral extension of said face clutch plate extending radially therefrom in an engagement path with said pawl urging and holding said pawl out of engagement with said ratchet when said finger is in said notch and when said drum is retracting, and a movement limiting stop extending from said clutch plate to engage said frame and said plate thus limited in one direction to engage said finger in said notch and limited in withdrawal direction of said drum to a position of said cam-like extension out of engagement with said pawl.

3,963,194

DISPENSER FOR COILED ELONGATED FLEXIBLE PRODUCT

Charles C. Butts, Hacienda Heights, Calif., assignor to Davis Walker Corporation, Los Angeles, Calif.

Filed June 20, 1974, Ser. No. 481,144
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129 **10 Claims**



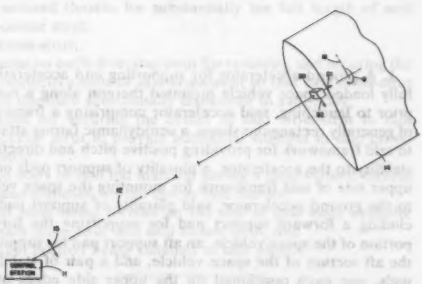
1. Apparatus for dispensing an elongated flexible material, such as, wire, cable, rope and the like, from an annular coil of the material, the apparatus comprising a base having a vertical opening therethrough, an upright hollow spindle mounted on the base and over the opening through the base, the spindle being shaped to fit within the annular coil of material so that the top end of the material on the coil can be pulled from the coil, and means for guiding the material from the top of the coil down through the spindle and opening in the base, and out from under the base, the guiding means including an upwardly converging cap mounted on the upper end of the spindle and means for removably clamping the cap on the upper end of the spindle.

3,963,195

ROLL REFERENCE SYSTEM FOR VEHICLES UTILIZING OPTICAL BEAM CONTROL

Frank S. Coxe, Santa Ana; Lyle A. Maxey, Dana Point, and David P. Wahl, Whittier, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Jan. 27, 1975, Ser. No. 544,640
Int. Cl.² F41G *7/00*
U.S. Cl. 244—3.11 **6 Claims**



1. In a control system for a vehicle, said system including a control station for transmitting an optical beam for carrying the control information, said beam having polarized waves, means for generating a roll stabilization signal for said vehicle comprising:

polarizing beam splitter means fixedly mounted on said vehicle for receiving said optical beam and providing at least one light output as a function of the angle between the polarization angle of said light waves and the plane of a predetermined side face of said beam splitter means,

means for transducing said light output to a first electrical signal,

means for amplifying said electrical signal,

means for generating a second electrical signal in accordance with the non-polarized components of the optical beam, and

means for dividing said first electrical signal by said second electrical signal thereby eliminating electrical components representing non-polarized optical components in said first electrical signal,

the output of said dividing means being in accordance with the deviation of the roll angle of said vehicle from a predetermined orientation.

3,963,196

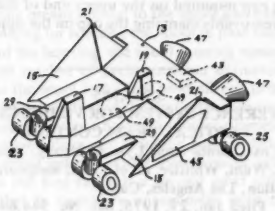
AIRCRAFT/SPACECRAFT GROUND ACCELERATOR

William H. Walker, Bellevue, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 12, 1974, Ser. No. 478,551

Int. Cl.[2] B64F 1/10

U.S. Cl. 244—50 1 Claim



1. A ground accelerator for supporting and accelerating a fully loaded space vehicle mounted thereon along a runway prior to launching, said accelerator comprising a framework of generally rectangular shape, a aerodynamic fairing attached to said framework for providing positive pitch and directional stability to the accelerator, a plurality of support pads on the upper side of said framework for mounting the space vehicle to the ground accelerator, said plurality of support pads including a forward support pad for supporting the forward portion of the space vehicle, an aft support pad for supporting the aft section of the space vehicle, and a pair of stabilizing pads, one each positioned on the upper side edges of the accelerator to provide further support for the space vehicle, a plurality of wheel/tires positioned at each corner of the accelerator in contact with the runway surface for supporting the accelerator and providing mobility thereto, said plurality of wheel/tires including a pair of forward sets positioned one set at each forward corner of the accelerator, and a pair of aft sets each positioned at each rearward corner of the accelerator, each of said wheel/tires including an epoxy glass filled matrix with silastic foam core elements embedded therein and a tire tread around the outer circumferential surface thereof, means for accelerating the ground accelerator along the runway to reach a predetermined critical speed.

3,963,197

CONTROL DEVICE FOR AVOIDING THE PITCHING UP OF MISSILES OR AIRCRAFT

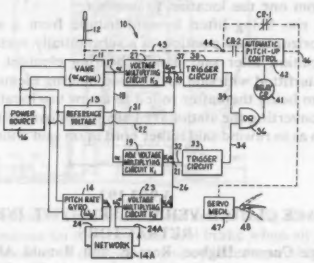
Erhard Oberlerchner, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Continuation-in-part of Ser. No. 315,635, Dec. 15, 1972, abandoned. This application Aug. 14, 1074, Ser. No. 497,504

Claims priority, application Germany, Dec. 16, 1971, 2162349

Int. Cl.[2] B64C 13/50

U.S. Cl. 244—181 11 Claims



1. A method for avoiding a pitching up of aircraft during flight, comprising the steps of:

detecting the instantaneous angle of attack and producing a first signal;

detecting the rate of change of said angle of attack in response to a change in control surface position initiated by a pilot for said aircraft and producing a second signal;

disconnecting direct command of the control surface movement by the pilot in response to said first and second signals in advance of reaching a permissible angle of attack for said aircraft so that said direct commands from said pilot will ineffective to control the aircraft beyond said permissible angle of attack; and

thereafter modulating said direct commands from said pilot so that the continued performance of said aircraft will be optimized by approaching said permissible angle of attack but not exceeding same, said optimizing occurring only as long as said first and second signals, which indicate the demand of said pilot, indicate that said permissible angle of attack will be exceeded.

5. In an apparatus for avoiding a pitching up of aircraft having a movable control surface thereon controlled by a pilot for said aircraft and control means for modulating direct commands from said pilot so that the performance of said aircraft will be optimized by approaching a permissible angle of attack but not exceeding same, the improvement comprising:

first means for detecting the instantaneous angle of attack and producing a first signal;

second means for detecting the rate of change of said angle of attack in response to a change in control surface position initiated by said pilot and producing a second signal;

trigger circuit means defining said permissible angle of attack and being responsive to said first and second signals for disconnecting a direct command over a control surface movement by said pilot for said aircraft in response to said first and second signals which indicate that said aircraft will travel in a manner to exceed said permissible angle of attack, said direct command over said control surface movement by said pilot being stopped in advance of reaching said permissible angle of attack, said control means being responsive to a stopping of said pilot's direct command over said control surface movement and effecting a modulating of said direct commands from said pilot so that the continued performance of said aircraft will be optimized by approaching said permissible

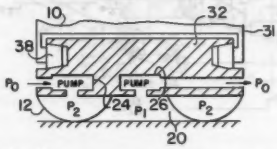
angle of attack but not exceeding the permissible angle of attack, said optimizing occurring only as long as said first and second signals indicate that said permissible angle of attack will be exceeded.

3,963,198

NEGATIVE AIR CUSHION FOR AIRSHIP GROUND HANDLING

John C. Vaughan, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1975, Ser. No. 564,570
Int. Cl.² B60V *3/08*
U.S. Cl. 244—100 A **4 Claims**



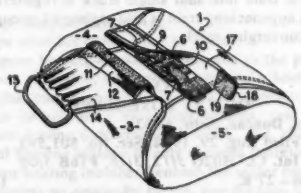
1. A negative air cushion landing and mooring system for an aircraft capable of hovering descent comprising:
a trunk member attached to the bottom of said aircraft;
a central compartment,
said trunk member encircling and forming the side walls of said central member, the top of said compartment being sealed and the bottom of said compartment being open to the atmosphere;
means for inflating said trunk member to a pressure greater than atmospheric, said trunk member being formed from a fluidtight fabric;
means for evacuating said central compartment to a pressure less than atmospheric, whereby suction is created which clamps said aircraft to the ground; and
swivel means mounted between said aircraft and said trunk member,
whereby said aircraft is enabled to rotate and weathervane about the vertical axis of symmetry of said trunk.

3,963,199

CLOSING DEVICE FOR A PARACHUTE PACK

Marcel Pravaz, Clichy, France, assignor to Etudes et Fabrications Aeronautiques, Paris, France

Filed May 20, 1974, Ser. No. 471,705
Claims priority, application France, May 21, 1973, 73.18397
Int. Cl.² B64D *17/46*
U.S. Cl. 244—148 **11 Claims**



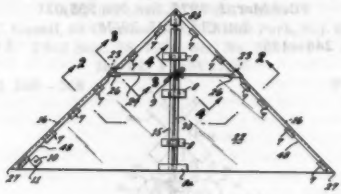
1. A closing device for a parachute pack having pack-closing flaps which are capable of moving apart from each other from a pack-closing position to a position in which the flaps define an opening in the pack through which opening the parachute can emerge from the pack, said device comprising first and second gripping bands respectively secured to at least two opposed flaps of the pack, gripping band means for maintaining said first and second gripping bands assembled in a pack-closing position by attachment of the gripping band means to said first and second gripping bands, the gripping band means having an edge by which the gripping band means is to be progressively detached by peeling off from said first and second gripping bands in starting at said edge, pulling means for controlling the opening of the pack by a pull exerted on the pulling means substantially in a given direction, a flexible connecting element having one end connected to the pulling means and an opposite end connected to said edge of the gripping band means, the pulling means being disposed on the opposite side of the gripping band means to said edge and the flexible connecting element being folded at 180° around said edge and extending in a direction which is substantially said given direction in overlapping relation to the gripping band means from said edge to said pulling means when the closing device is operative to close the pack.

3,963,200

KITE WITH A DIVERGING WING STRUTS WITH A CENTER STRUT AND A CROSSING-STRUT SECURED TO BOTH DIVERGING STRUTS AND THE CENTER STRUT

Bennett R. Arnstein, 3049 W. Eight St., Los Angeles, Calif. 90005

Filed Mar. 24, 1975, Ser. No. 551,215
Int. Cl.² B64C *31/06*
U.S. Cl. 244—153 R **7 Claims**



1. A kite comprising:
a body of flat material symmetrical about a center line;
a pair of diverging wing struts secured to said body on opposite sides of said center line;
a center strut disposed on the center line of said body and secured thereto for substantially the full length of said center strut;
a cross-strut;
means on each diverging strut for receiving and securing the respective ends of said cross-strut so that said cross-strut is disposed substantially transverse to said body;
means for securing the center of said cross-strut to said center strut to provide additional stiffness to said cross-strut;
said body of said flat material having a pleat formed therein and disposed on the center line thereof;
said pleat being formed on the side of said body opposite said cross-strut and said center strut; and
a keel portion being fastened to said pleat.

3,963,201

SEQUENTIAL OCCUPANCY RELEASE CONTROL METHOD AND APPARATUS FOR TRAIN VEHICLES

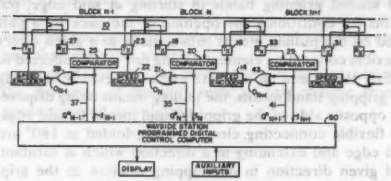
Neil A. Brumberger, Pittsburgh; Bennie C. Auxer, Trafford, and Donald L. Rush, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 554,781
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 R **20 Claims**

1. An apparatus for controlling the speed of a plurality of train vehicles along a track including a plurality of signal blocks, the combination of

means for providing an occupancy indication signal in relation to the occupancy of a first signal block by one of said train vehicles,

means for providing first and second protection signals in relation to a second signal block previous to said first



signal block and in response to said occupancy indication signal, and

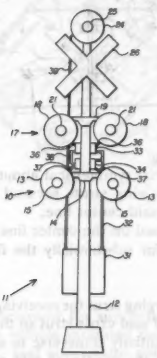
means for providing an occupancy control signal in response to a selected one of said first and second protection signals in accordance with predetermined characteristics of said first signal block.

3,963,202

GRADE-CROSSING MOTORIST WARNING SYSTEM

John B. Hopkins, Cambridge, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 555,021
Int. Cl.² B61L *29/28*
U.S. Cl. 246—125 **5 Claims**



1. A railroad-highway crossing warning system comprising:

support means for location near a crossing;

a primary warning system mounted on said support means and comprising a pair of incandescent lamp means oriented so as to be visible to a vehicle operator approaching the crossing;

incandescent lamp control means for periodically energizing each of said incandescent lamp means at a given rate;

an auxiliary warning system mounted on said support means and comprising a pair of xenon lamp means oriented so as to be simultaneously visible with said incandescent lamps to the same operator;

xenon control means for periodically energizing each of said xenon lamp means at a predetermined rate;

synchronization means for synchronizing said given and predetermined rates; and

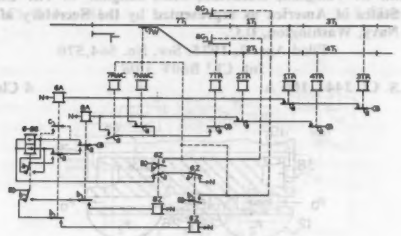
train detector means for producing a train-presence signal to activate said incandescent lamp control means and said xenon control means in response to approach of a train to the crossing.

3,963,203

AUTOMATIC CONTROL SYSTEM FOR RAILROAD INTERLOCKING

Frank T. Pascoe, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jan. 30, 1975, Ser. No. 545,425
Int. Cl.² B61L *21/04*
U.S. Cl. 246—134 **6 Claims**



1. A control arrangement for automatically alternating the passage of trains from two converging tracks through a track switch into a single track, comprising in combination,

a. a first and a second approach relay coupled for registering the occupancy of the one or the other converging track, respectively, by an approaching train,

b. train detector means coupled for detecting a train occupying a prefixed interlocking area where said tracks converge through said track switch into said single track,

c. an indication means controlled by said switch for registering the established route condition,

d. a sequencing means operable to a first and a second condition corresponding to one and the other converging tracks, respectively,

e. route selection means controlled by said first and second approach relays and by said sequencing means and coupled for enabling the preparation of a route from one or the other converging track as an approaching train is detected in the corresponding track and said sequencing means operates to its corresponding condition,

f. a reset circuit means controlled by said train detection means and said indication means and connected for resetting the approach relay, corresponding to the converging track on which a train, now detected in said prefixed interlocking area, approached, to a non-occupancy condition to register that train's passage into said single track, and

g. an operating circuit means controlled by said first and second approach relays and connected for operating said sequencing means to a condition corresponding to a first approaching train registered occupying a particular converging track and to the other condition when passage of said first train into said single track is registered and a second approaching train is also registered occupying the other converging track.

3,963,204

OUTLET BOXHOLDER

John F. Liss, Duncan, Nebr. 68634

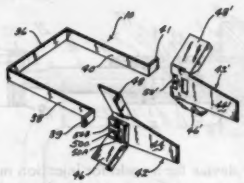
Filed Aug. 29, 1974, Ser. No. 501,592
Int. Cl.² H02G *3/12, 3/18;* F16B *5/06*
U.S. Cl. 248—27 R **15 Claims**

1. A means for mounting an electrical outlet box in an opening formed in a wall member, said wall member having inner and outer wall surfaces, comprising,

a substantially U-shaped strap member having a base portion and a pair of depending legs, said strap member adapted to be inserted into the opening in said wall member so that the free ends of said legs extend outwardly therefrom,

a first retainer means slidably mounted on one of said legs and having a first portion thereon for engagement with the said inner wall surface and having a second portion extending outwardly from said opening,

a second retainer means slidably mounted on the other of said legs and having a first portion thereon for engagement with the said inner wall surface and having a second portion extending outwardly from said opening,



said opening, said U-shaped strap member and first and second retainer means adapted to receive outlet box therein, said second portions of said retainer means being deformable so that the second portions of said retainer means may be folded inwardly around the outer edges of said box,

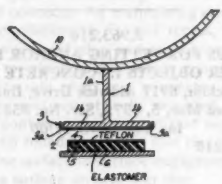
said strap member having free ends on each of said legs for engagement with the outside surface of said wall member.

3,963,205

PIPE SUPPORT SYSTEMS

Drew W. Hageman, P.O. Box 224, Stn. "Q", Toronto, Canada

Filed Apr. 4, 1974, Ser. No. 457,857
Int. Cl.² F16L 3/16
U.S. Cl. 248—55 **8 Claims**



1. A pipe support comprising

a. a pipe shoe for connection to a pipe;

b. an upper bearing member connected to the pipe shoe to support the same, said member having a horizontal portion that curves upwardly at a pair of opposite edges into a pair of upwardly extending returns, said horizontal portion having a downwardly facing, flat, smooth, horizontal bearing surface fixedly secured thereto; and

c. a lower bearing member beneath the upper bearing member having an upwardly facing, low-friction bearing surface secured to and surmounting a layer of elastomeric material that in turn is secured to and surmounts a base plate for mounting the lower bearing member in a fixed location;

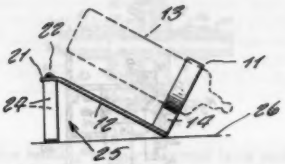
d. said bearing surfaces directly engaging each other in free sliding relationship in any direction in a horizontal plane defined by said surfaces.

3,963,206

BABY BOTTLE HANDLE

Barbara Scolaro, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed May 20, 1975, Ser. No. 579,136
Int. Cl.² A61J 9/06
U.S. Cl. 248—105 **4 Claims**



1. In a baby bottle handle device, the combination of a cylindrical ring and a straight handle, said ring being circular and adapted to receive and retain frictionally therethrough a baby bottle, including a transverse spacer fin integrally connecting the ring and one end of said handle wherein said handle is parallel to the ring axis.

3,963,207

ADJUSTABLE SUPPORT LEG

Peter C. Guasti, 48 Crescent Ave., Cliffside Park, N.J. 07010

Filed Sept. 16, 1974, Ser. No. 506,041
Int. Cl.² F16M 11/38
U.S. Cl. 248—168 **9 Claims**

1. A support leg of the type used as part of a tripod, said tripod having a seat with leg engaging bosses extending therefrom, said leg comprising:

a. a pair of spaced, rod-like members being pivotally securable at one end to the tripod bosses;

b. first spacer means secured to said rod-like members substantially at the end opposed to said end being pivotally securable and having an aperture therethrough;

c. second spacer means secured to said rod-like members intermediate said first spacer and said pivotal end;

d. a third rod-like member secured to said second spacer and disposed between said first and second spacers and said pair of rod-like members;

e. a fourth rod-like member slidable through said aperture and engaging said third rod-like member between said first and second spacers and said pair of rod-like members, the end of said fourth rod-like member extending beyond said pair of rod-like members and said first and second spacers and comprising foot means for standing said leg against the ground; and

f. engaging means located between said first and second spacer means for adjustably securing said third rod to said fourth rod.

3,963,208

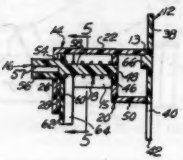
SPRING-PRESSED-PLUNGER ARTICLE HOLDER

Clarence Sova, 2160 Union St., Windsor, Ontario, Canada

Filed Feb. 7, 1975, Ser. No. 547,792

Int. Cl.² A47H 1/10

U.S. Cl. 248—316 A 1 Claim



1. A spring-pressed-plunger article holder adapted to be mounted upon an upright wall, said article holder comprising

an elongated hollow open-bottomed support having a top wall and laterally-spaced side walls and a forward end wall,

an article-holder-mounting base plate secured to the rearward end of said support,

said walls and said base plate cooperatively defining an elongated open-bottomed plunger-housing cavity in said support,

said forward end wall having a forward plunger guide hole therethrough and having a fixed article-gripping jaw extending downward therefrom,

a combined rearward spring abutment and plunger guide member disposed in said cavity in direct engagement with said base plate,

said combined abutment and guide member having a rearward plunger guide hole therethrough coaxial with said forward guide hole,

means for securing said rearward spring abutment and plunger guide member within said support cavity with its rearward plunger guide hole in alignment with said forward plunger guide hole,

an elongated plunger slidably mounted in said guide holes and having a push-button portion projecting forwardly from said forward end wall,

said plunger also having a movable article-gripping jaw depending transversely therefrom in parallel relationship to said fixed article-gripping jaw and movable unitarily with said plunger,

and a spring member disposed between said movable jaw and said spring abutment and plunger guide member and adapted to urge said movable article-gripping jaw toward said fixed article-gripping jaw into gripping engagement with an article disposed therebetween,

said combined rearward spring abutment and plunger guide member being of up-ended scoop shaped construction with a front wall, a pair of side walls disposed in spaced parallel relationship, and a bottom wall interconnecting the lower ends of said front wall and side walls,

said plunger being loosely mounted in said rearward guide hole whereby to greatly facilitate tilting and sliding of said abutment and guide member relatively to said plunger during assembly,

said side walls of said abutment and guide member having rounded upper rearward corners adapted to rockably and slidably engage said base plate during tiltable insertion of said member into said cavity.

3,963,209

EJECTOR PIN ASSEMBLY FOR INJECTION MOULDING TOOLS

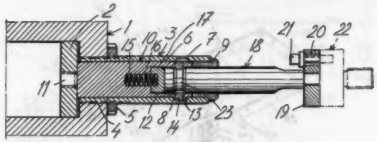
Hans K. Muller, Krakkarrsgatan 31, 502 40 Boras, Sweden

Continuation-in-part of Ser. No. 245,953, April 21, 1972, abandoned. This application Aug. 21, 1974, Ser. No. 499,545

Claims priority, application Sweden, Apr. 22, 1971, 5240/71

Int. Cl.² B29C 7/00

U.S. Cl. 249—67 5 Claims



1. An ejector device for a mold for injection molding, comprising a mold having an ejector pin plate located in the mold, a hollow sleeve being secured to the rear end of said mold and projecting backwards therefrom, a sliding member being slidably arranged in said sleeve and having one end thereof positioned for acting upon said ejector plate whereas its opposite end is tubular and is provided with radially extending holes, coupling members slidable in said holes, an ejector rod having a free end portion provided with an annular groove and having at least in said end portion a diameter such that it may be introduced in said tubular part of said sliding member, the wall thickness of said tubular part of said sliding member and the depth of said annular groove of said ejector rod being such that when said groove and said holes are in register and the coupling members are in said annular groove said coupling members do not project outside said sliding member whereas said coupling members project outside said sliding member when said coupling members are in contact with the ungrooved portion of said ejector rod, said sleeve having an internal annular groove provided to receive said coupling members, a spring biassed member being arranged within said tubular part of said sliding member and being provided to hold in its normal outer position said coupling members in their projecting position.

3,963,210

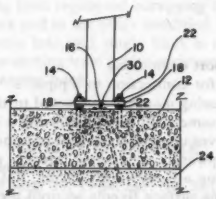
APPARATUS FOR SETTING ANCHOR BOLTS AND OTHER OBJECTS IN CONCRETE SLABS

Charles D. Macklin, 8911 Aldwick Drive, Dallas, Tex. 75238

Filed Mar. 5, 1975, Ser. No. 555,531

Int. Cl.² E04G 17/00

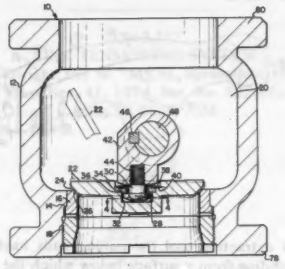
U.S. Cl. 249—210 7 Claims



1. An apparatus for use in setting anchor bolts in concrete, said apparatus comprising a support having a rigid plate, elongate legs extending transversely from one side of said plate for supporting said plate at an elevated position within a concrete form, a pierceable block releasably attached to said plate, a template releasably carrying a plurality of anchor bolts held in a predetermined spacial relationship, and means on said template for releasably attaching said template to said

pierceable block whereby said anchor bolts are supported in a predetermined relationship in said form during the pouring of said concrete.

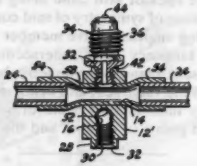
3,963,211
ROTARY VALVE
Edward Barless Myers, Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 23, 1974, Ser. No. 517,382
Int. Cl.² F16K 25/00
U.S. Cl. 251—85 10 Claims



1. A control valve for regulating the flow of a fluid, comprising a body portion that forms a valve chamber, an annular seat ring forming an opening in the wall of said chamber, a valve actuator arm mounted at one of its ends for eccentric rocking movement in said chamber about an axis that is radially displaced from the axis of said seat ring, a plug having a spherical shaped seat and a wall forming a recess in a base portion thereof, a connector having a head portion at one end thereof positioned in said recess and a shank extending therefrom that has an end portion connected for movement with said actuator arm, an annular retaining ring positioned in spaced apart relationship to the head portion of said connector, said retaining ring being connected to the recessed wall portion and positioned in spaced relationship about a remaining shank portion of said connector for maintaining said head portion in loose captured relationship in said recess, a biasing means extending between said plug and an outer end of said valve actuator arm to which said shank is connected to apply a biasing force to said plug, said connector and said biasing means enabling said eccentrically mounted plug to be swiveled into line contact with a part of said seat ring and to be jointly tilted and rolled about said seat ring part into and out of fluid tight line surface to surface engagement with an entire annular seating surface on said seat ring.

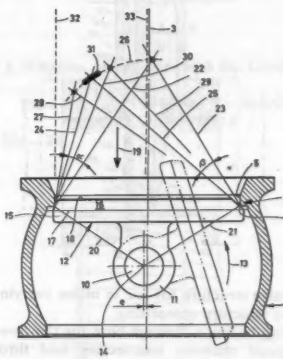
3,963,212
TWO-WAY TEE FOR JOINING REFRIGERANT LINES
John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120
Filed Dec. 23, 1974, Ser. No. 535,630
Int. Cl.² F16K 51/00
U.S. Cl. 251—145 1 Claim

1. A refrigerant line tee, comprising:
an elongated body having a transverse bore;
a tube-like axial extension formed on one end portion of said body,
said extension and said one end portion of said body having a threaded bore communicating with the transverse bore and having an annular outwardly facing seat;
a tube extending through the transverse bore and sealed with said body,
said tube having a lateral aperture communicating with the threaded bore,
the respective end portions of said tube being externally upset adjacent said body; and,
a valve housing threadedly engaged within the threaded bore and having a tapered surface sealing fluid tight with said annular seat,



said valve housing having a central bore and having a depressible valve for opening and closing the central bore.

3,963,213
BUTTERFLY VALVE
Axel Wilhelm Brattberg, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed Oct. 11, 1974, Ser. No. 514,028
Claims priority, application Sweden, Oct. 15, 1973, 7313937
Int. Cl.² F16K 1/22
U.S. Cl. 251—306 6 Claims



1. A butterfly valve comprising a valve housing defining a valve seat which lies in a plane and a fluid passage which extends through the valve seat and which has an axis normal to said plane, said butterfly valve also comprising a valve member in said housing that is rotatable back and forth about a pivot axis which is spaced in one direction from said passage axis and is parallel to said plane and spaced to one side thereof, such rotation of the valve member carrying it between a closed position in which it sealingly engages the valve seat all around the same and an open position in which the valve member is oriented substantially edgewise to the valve seat, said butterfly valve being characterized by:
A. said valve seat being provided by a radially inner edge on land-like means in the housing, which edge is circular and concentric to the passage axis;
B. said valve member having a peripheral sealing surface cooperable with the valve seat, which surface extends axially from one to the other of a pair of parallel planes and corresponds to the frustum of an oblique circular cone symmetrical to a plane which is normal to the pivot axis and which contains the passage axis, said cone, considering the valve member in its closed position, having its

circular base normal to the passage axis and having its apex spaced to the opposite side of the valve seat and spaced in said direction from the passage axis, and said surface thus being circular on each of said pair of planes and on every plane between them that is parallel to them, for close fit with said circular edge that provides the valve seat, and the apex of said cone being further so located that in the plane of symmetry of said cone its generatrices are at wedging angles to valve member rotation tangency lines, said tangency lines intersecting the points of contact in said plane of symmetry between the valve member and the valve seat and being respectively normal to imaginary lines in said plane of symmetry that pass through said points of contact and the pivot axis.

3,963,214

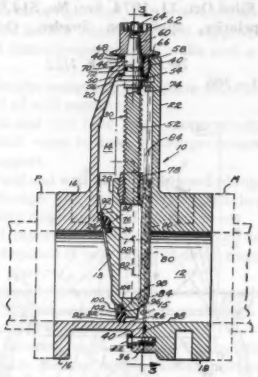
RESILIENT SEATED GATE VALVE WITH SPLIT BODY

Frank C. Hackman, Albertville, Ala.; Lawrence F. Luckenbill, and Joseph L. Daghe, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed Nov. 26, 1974, Ser. No. 527,493

Int. Cl.² F16K *3/12*

U.S. Cl. 251—326 **27 Claims**



1. A gate valve structure for use in mains carrying a fluid, said gate valve structure comprising:

a valve casing having a through-bore for the flow of fluid, an elongated chamber intersecting said through-bore intermediate its ends and defining inlet and outlet ports to the chamber, and a valve seat surrounding one of said ports in said through-bore;

said valve casing being divided into two body members on a plane normal to an axis of said through-bore, and said body members, when secured to each other, defining said elongated chamber and said through-bore, one of said body members containing said valve seat and being provided with a bore to the exterior thereof having an axis normal to said through-bore;

said valve seat in said one body member lying generally in a plane which converges at an acute angle to a plane normal to the axis of the through-bore and towards the other body member, said valve seat further facing said other body member except at a bottom portion thereof where it merges into and forms a portion of said through-bore of said one body member;

a generally flat gate member reciprocable in said elongated chamber from a closed position across said through-bore and seating against said valve seat to an opened portion out of said through-bore, said gate member including an annular resilient seal member having a bulbous portion for engaging said valve seat;

means for adjustably retaining said seal member on said gate member;

and valve stem means operatively connected to said gate member and extending through said bore in said one body member, said valve stem means being operable to move said gate member between the closed and opened positions.

3,963,215

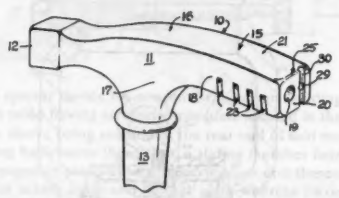
NAIL EXTRACTOR TOOL

Harry F. Connor, 3066 Alviena Drive, San Jose, Calif. 95133

Filed Oct. 28, 1975, Ser. No. 625,936

Int. Cl.² B66F *15/00*

U.S. Cl. 254—26 R **3 Claims**



1. A nail extracting tool for pulling nails having a head portion extending from a surface below which the balance of such nail is embedded comprising:

1. a handle;
2. a solid member extending laterally from one end of said handle;
3. a bore formed in said solid member from the free end thereof toward said handle for receiving that portion of a nail extending from and to be extracted from such surface;
4. said solid member having an arcuate contour on its extreme outer face adapted to engage the surface from which the nail is to be pulled;
5. a fulcrum corner between said outer face and the free end of said solid member for initially bending the shank of such nail at the open end of said bore during manipulation of said handle by movement thereof about said fulcrum corner and to thereby create a snubbing action between such nail and the solid member during continued movement of the arcuate outer face of the latter relative to the surface from which the nail is to be extracted; and
6. a slit formed in said solid member from that face thereof opposite its arcuate outer face into communication with the bore formed in said member for receiving the head of a nail disposed in the bore during the initial bending of the shank of such nail.

3,963,216

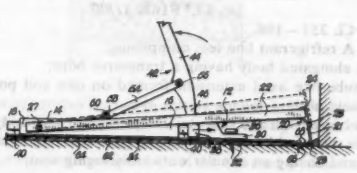
CARPET STRETCHER

Harold Richard Victor, 1300 E. Elm, Olathe, Kans. 66061

Filed June 23, 1975, Ser. No. 589,434

Int. Cl.² A47G *27/04*

U.S. Cl. 254—62 **9 Claims**



1. An adapter for converting a carpet stretcher having an elongate base and a carpet-engaging head telescopically

mounted on the normally front end of the base from a tool that pushes against a rear wall to a tool that pulls against a forward tack strip, said adapter including:

a pair of elongate, laterally spaced apart support arms, each having a first and second end;

a coupler at said first ends for detachably connecting said arms to said base behind said front end; and

an anchor carried by said second ends,

said arms being of sufficient length to position said anchor beyond said carpet-engaging head when the adapter is connected to said base by said coupler, thereby permitting the anchor to engage the remote edge of a tack strip beyond said head to retain the base as the head is shifted away from said base toward said anchor.

3,963,217

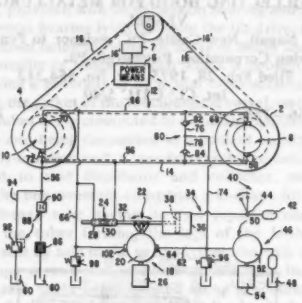
LINE TENSIONING SYSTEM

Bernard L. Dwight, 507 W. "M" St., Springfield, Oreg. 97477

Filed Nov. 11, 1974, Ser. No. 522,451

Int. Cl.² B66D *1/26*

U.S. Cl. 254—185 R **30 Claims**



1. A line tensioning system, comprising:

powered drum means engaging the line at opposite ends thereof for alternately spooling and unspooling the line;

fluid actuated fixed displacement means connected with at least one of said drum means for applying a force to said one drum means, so as to exert tensioning effort upon the line when unspooled therefrom; and

variable displacement means in fluid communication with said fixed displacement means for supplying fluid to and receiving fluid from said fixed displacement means and for maintaining a constant fluid pressure differential between the pressure of said fluid supplied to said fixed displacement means and said fluid received from said fixed displacement means in spite of fluctuations in the pressure of the fluid either received from or supplied to said fixed displacement means, whereby a uniform tensioning effort is exerted on said line during spooling and unspooling by said one drum means.

3,963,218

VEHICLE GUARDRAIL WITH METAL CORE

Ernest Glaesener, Dudelange, Luxemburg, assignor to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxemburg

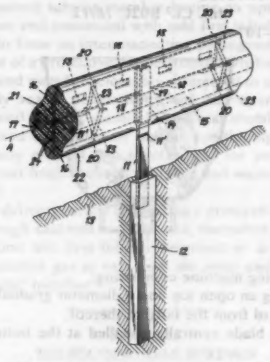
Filed June 26, 1973, Ser. No. 373,867

Claims priority, application Germany, June 29, 1972, 2231763

Int. Cl.² E01F *15/00*

U.S. Cl. 256—13.1 **9 Claims**

1. A continuous guardrail assembly comprising: a flexible rail consisting of a core and a sheath, said core comprising a continuous elongated metal core structure of sheet metal of longitudinally extending angularly adjoining plate sections respectively lying in mutually intersecting longitudinal planes, said sheath comprising a continous mass of synthetic-resin foam surrounding said core structure, said structure being fully embedded in said foam mass and said mass completely



filling said structure; and a plurality of breakaway posts supporting said structure at predetermined intervals, said core structure and said posts being formed with mating means adapted to enable said structure to receive said posts.

3,963,219

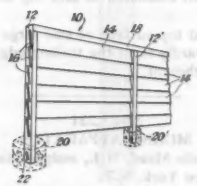
FENCE

Anthony J. D'Amico, 10390 NW. 36th St., Coral Springs, Fla. 33065

Filed Apr. 30, 1974, Ser. No. 465,693

Int. Cl.² E04H *17/14*

U.S. Cl. 256—24 **2 Claims**



1. A fence comprising:

a plurality of rigid, intermediate vertically oriented aluminum support members, said support members being tubular in construction and having a plurality of obliquely oriented oppositely disposed on each face parallel to slotted portions on opposite side walls, said slotted portions lying in the same plane between adjacent vertical intermediate support members;

a plurality of relatively long, continuous aluminum, relatively thin flexible panels said panels being threaded and disposed through the slotted portions in the same plane of the intermediate vertical support members; and

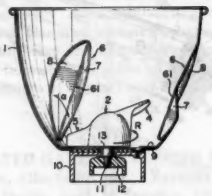
at least two terminal vertical supports, and a means for coupling said flexible panels to said terminal vertically supports having a plurality of oblique slotted parallel side wall portions for receiving said panels therethrough;

said flexible panel end has a cut-away portion forming a tab which is received through and wrapped about one of said terminal posts, and a fastening means for coupling said tabbed end portion of said flexible panel to said terminal vertical support member.

3,963,220
KNEADING MACHINE

Shuzo Ohchi, 39-3, Wada 3-chome, Suginami, Tokyo, Japan

Filed June 23, 1975, Ser. No. 589,778
Claims priority, application Japan, July 5, 1974, 49-76495; July 5, 1974, 49-76496
Int. Cl.² B02C 18/12
U.S. Cl. 259—107 5 Claims

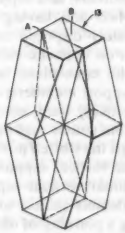


1. A kneading machine comprising:
a pot having an open top and a diameter gradually increasing upward from the bottom thereof;
a rotatable blade centrally installed at the bottom of said pot;
a plurality of projections provided on the inside wall of said pot and inclined to the central vertical axis of said pot;
said rotatable blade comprising a blade body, a small blade and a large blade integrally fitted to said body at a circumferential angle of separation of 180° - 270°;
said small blade comprising a rectangular plate fitted to said body and extending outwardly therefrom and forwardly downwardly inclined relative to said central vertical axis of said body, the bottom of the small blade being on the same horizontal plane as the bottom of said body, said small blade having a top side integrally fitted to said body at a position thereof lower in the vertical direction than the top center of the body;
said large blade having a wing-shaped top surface rising outwardly from a position adjacent the topmost plane of the body, said large blade having a trailing surface on substantially an extension of said top side of said small blade; and
said wing-shaped top surface of said large blade being inclined downwardly from the trailing edge thereof to the leading edge thereof.

3,963,221
MIXING APPARATUS

Chang-Han Yi, Belle Mead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,783
Int. Cl.² B01F 5/00
U.S. Cl. 259—180 4 Claims

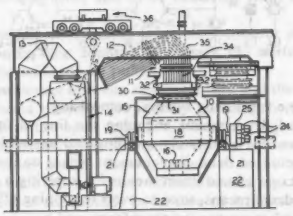


1. A mixing apparatus comprising a conduit of a predetermined length extending along a main flow path, wherein the cross-sectional area of said conduit is substantially constant at all positions along said main flow path, and wherein said mixing apparatus is composed of a plurality of units of predetermined length disposed adjacently and serially along said main flow path, each unit having an ingress end and an egress end, and each unit being composed of a plurality of sub-conduits, each sub-conduit of each unit having a major axis and a minor axis in cross-section at the ingress end thereof, means within each unit to alter each sub-conduit such that the major and minor axes in cross-section are reversed at the egress end of each unit, wherein the cross-sectional area of each sub-conduit of each unit is substantially constant throughout the entire length of each unit, wherein each sub-conduit of each unit is described by planar surfaces, and wherein the major and minor axes in cross-section of each sub-conduit at the egress end thereof are reversed with respect to the major and minor axes in cross-section of each sub-conduit at the ingress end of the next adjacent unit along said main flow path, said mixing apparatus being suitable for use in the gravity feed mixing of granular materials.

3,963,222
GAS COLLECTING HOOD FOR METALLURGICAL VESSEL

Rashed N. Nagati, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1975, Ser. No. 554,312
Int. Cl.² C21C 5/40
U.S. Cl. 266—158 12 Claims



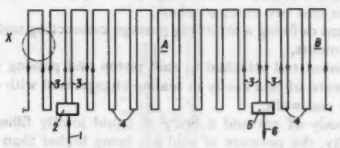
1. A hood for receiving gases from the open end of a metallurgical vessel in which oxygen is delivered to a metal charge wherein substantial quantities of hot gases are evolved,
said hood including a hollow elbow portion having an inlet adapted to be positioned above the open end of said vessel for receiving upwardly directed gases and an outlet, said elbow portion also including a laterally extending upper surface area lying in the path of said upwardly directed gases for intercepting said gases and for redirecting the same generally laterally to said outlet,
and flow divider means disposed in said elbow and positioned in the path of said upwardly directed gases, said flow divider means including a portion arranged in general parallelism with the flow direction defined by said surface area and generally across a portion of the path of said upwardly directed gases and between the inlet of said hood and said area for dividing said elbow into upper and lower flow passages beneath said surface area to divert a substantial portion of said gases to said outlet without direct contact with said surface area.

3,963,223

METALLURGICAL VESSEL, IN PARTICULAR A CONVERTER

Manfred Eysn, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed July 1, 1974, Ser. No. 484,781
Claims priority, application Austria, July 23, 1973, 6469/73
Int. Cl.² C21C 5/46
U.S. Cl. 266—241 12 Claims



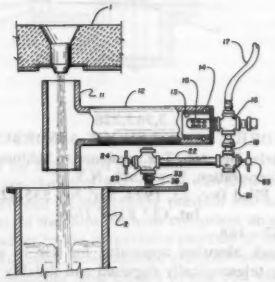
1. A metallurgical vessel, e.g. a converter having a converter mouth, said metallurgical vessel being surrounded by a steel jacket, carried in a carrying ring, rotatable about a trunnion axis, provided with an expansion bearing and a tilt drive, the expansion bearing lying opposite the tilt drive, said metallurgical vessel being provided in zones of heavy thermal wear with a plurality of tubes through which a coolant flows, the tubes having a generally semicircular cross section and being welded to the jacket of the metallurgical vessel, one end of the series of tubes being connected to a coolant distributor and on the other end being connected to a coolant collector, a coolant-supply-conduit and a coolant-discharge-conduit being connected to said distributor and collector, respectively, wherein the improvement comprises a U-shape for the tubes, each U-shaped tube having its own separate base and leg sections, the tubes forming the legs of the U-shape being arranged side by side in the vertical direction with the base of the U-shape at one end when the vessel is in its operating position, said tubes being located along a generatrix of the jacket of the metallurgical vessel and the leg ends of one U-shaped tube being connected with the leg ends of the adjacent tube by connecting conduits.

3,963,224

GAS SHROUD

Bernard Robert Pollard, Aliquippa, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed July 30, 1975, Ser. No. 600,330
Int. Cl.² B22D 11/10
U.S. Cl. 266—207 4 Claims



1. In the combination of shrouding apparatus for establishing and maintaining a protective gaseous atmosphere around a liquid stream during its transfer between distribution means comprising a first container having a liquid exit opening for passing the liquid stream through said shrouding apparatus and into collection means comprising a second container having a liquid entry opening, wherein the improvement comprises:

shrouding apparatus comprising

a. a shroud head having an open-ended tubular member positioned between said first and second containers without contacting said first and second containers and a second tubular member having an open end and its other end connected with said first tubular member so as to form an interconnecting passageway for the passage of a protective gas between said tubular members;

b. an end member releasably connected to and in substantially sealed relationship with the open end of said second tubular member, said end member supported by and connected to linkage positioning means comprising at least two pivot points for positioning said shroud head between said first and second containers; and

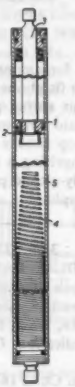
c. gas delivery means for passing a protective gas into and through said end member and, thereafter, through said second and first tubular members so as to cause the protective gas to exit from the open ends of said first tubular member.

3,963,225

TELESCOPIC GAS SPRINGS

Lawrence George Nicholls, Birmingham, England, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 259,578, June 5, 1972. This application Apr. 29, 1974, Ser. No. 465,240
Int. Cl.² F16F 5/00
U.S. Cl. 267—65 R 5 Claims



1. A gas spring comprising a cylinder containing gas under pressure and having a closed end and an open end, a piston rod and piston assembly operating in said cylinder, said rod extending slideably and sealingly through the open end of the cylinder and being moveable between a normally fully retracted position within the cylinder and a normally fully extended position, the pressure of the gas in said cylinder acting on the cross sectional area of said rod to urge it at all times towards its normally extended position, said piston being connected to said rod and slidably engaging the wall of said cylinder, damping orifice means extending through said piston, a reduced diameter bore at the closed end of said cylinder and having one end opening into said cylinder and its opposite end closed and immovable relative to said cylinder an extension carried by said piston rod and piston assembly and extending towards and in axial alignment with the open end of said reduced diameter bore, the relative length of said extension and said bore being such that said extension is clear of said reduced diameter bore when said piston rod is in its extended position, with said extension slidably and sealingly

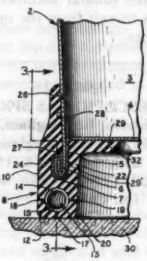
entering said bore during the terminal movement of said rod towards its retracted position to check the same by the increased fluid pressure trapped in said bore by said extension, said increased pressure in said bore thereafter providing an initially higher thrust on said rod during its initial movement from its retracted to its extended position than would be provided by the pressure of the gas alone in the cylinder the quantity of gas under pressure in said cylinder and said bore remaining at all times substantially constant.

3,963,226

REFUSE CONTAINER EDGE PROTECTOR

John J. Jankowski, Jr., 2511 N. Richmond St., Chicago, Ill. 60647

Filed Nov. 11, 1974, Ser. No. 522,587
Int. Cl.² B65D 7/42, 25/26; F16F 3/07, 3/10
U.S. Cl. 267—116 **10 Claims**



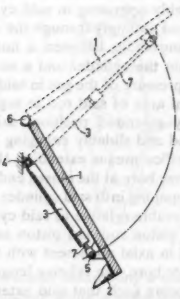
1. An edge protector for a container comprising an elastomer annulus adapted to fit about the lower edge of the container and having an air spring portion and a metal spring associated therewith, said springs disposed to operate conjunctively to absorb drop shocks imposed on the container, and said air spring comprising a tubular chamber formed in the annulus and partially-closed ports communicating the air chamber with the atmosphere.

3,963,227

GAS SPRING WITH DUAL DAMPING ARRANGEMENT

Werner Mölders, Mayen, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed Mar. 18, 1975, Ser. No. 559,515
Claims priority, application Germany, Mar. 26, 1974, 2414457
Int. Cl.² F16F 5/00
U.S. Cl. 267—120 **8 Claims**



1. A damping arrangement comprising:

a. a support defining an interior space having an open side;
b. a lid member;
c. hinge means securing said lid member to said support for movement about a horizontally extending axis between a first position in which said lid member closes said open side and a second position remote from said first position; and
d. a gas spring including:
   1. a cylinder having an axis and defining an axially elongated cavity therein, said cylinder including two axially spaced radial end walls,
   2. a piston axially movable in said cavity and dividing the same into two compartments,
   3. means defining a throttling passage connecting said compartments,
   4. a piston rod attached to said piston and passing axially outward of said cavity in sealing engagement with one of said end walls,
   5. a body of gas and a body of liquid jointly filling said cavity, the pressure of said gas being higher than atmospheric pressure,
   6. a plunger member secured to said one end wall in said cavity,
   7. a receptacle member mounted on said piston, said receptacle member being open toward said plunger member and dimensioned to receive said plunger member during axial movement of said piston rod outward of said cavity;
e. first pivot means pivotally fastening the other end wall to said support; and
f. second pivot means pivotally fastening said piston rod to said cover member,
   1. said second pivot means being downwardly spaced from said first pivot means in said first position of said lid member,
   2. said second pivot means being upwardly spaced from said first pivot means in said second position of said lid member, and
   3. the spacing of said first and second pivot means being sufficiently greater in said second position than in said first position to cause said plunger member to be received in said receptacle member in said second position of said lid member,
   4. said plunger member and said receptacle member jointly bounding a throttling aperture open toward said one compartment when said plunger member enters said receptacle member during said axial movement of said piston rod.

3,963,228

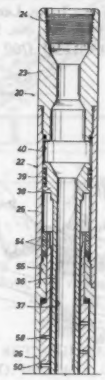
DRILL STRING SHOCK ABSORBER

Arun P. Karle, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,525
Int. Cl.² F16F 1/06
U.S. Cl. 267—166 **9 Claims**

1. A shock absorber apparatus for use in a drill string, comprising: telescopically disposed and slidably splined mandrel and housing members, one of said members being adapted for attachment to a drill string and the other of said members being adapted for attachment to a drill bit; an elongated, helical coil spring reacting between said members to absorb longitudinal vibrations and shock loads; and a hollow flow tube having one end portion sealingly slidable with respect to said housing member and another end portion sealingly slidable with respect to said mandrel member, said flow

tube defining wall surfaces of a chamber that encloses said coil spring and contains a lubricating oil, said flow tube being



arranged to transmit the pressures of a drilling fluid within said members to said oil.

3,963,229

DEVICE FOR MANIPULATING YARNS

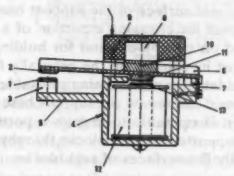
Adrianus Henricus van Duynhoven, Deurne, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Dec. 20, 1973, Ser. No. 426,798

Claims priority, application Netherlands, Dec. 22, 1972, 7217620

Int. Cl.[2] B25B *11/00*; B26D *7/02*

U.S. Cl. 269—8 1 Claim



1. A device for high speed manipulation of yarn, comprising a movable yarn-clamping jaw that is movably mounted for movement between an inoperative position and an operative position, wherein the improvement comprises an electric coil mounted adjacent to the inoperative position of said jaw, and a body of conducting, nonmagnetic material mounted on said jaw which approaches most closely to said coil when said jaw is in its inoperative positive, and in which eddy currents are induced by a pulse of current passed through said coil, to repel said jaw away from said coil toward its operative position, said yarn-clamping jaw also carrying an armature of magnetic material, and an electromagnet coil being mounted in a position which is most closely approached by said armature when said jaw is in its operative position, and which when energized maintains said jaw in its operative position.

3,963,230

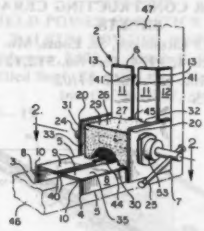
STUD AND BEAM CLAMP

John J. Jankowski, Jr., 2511 N. Richmond St., Chicago, Ill. 60647

Filed Nov. 11, 1974, Ser. No. 522,588

Int. Cl.[2] B25B *1/00*

U.S. Cl. 269—41 6 Claims



1. A clamp comprising a pair of opposed jaws presenting opposing abutment elements, a deformable elastomer member interposed between said elements, said jaws defining angularly offset passages accommodating deformation of said member therethrough for engagement with associated parts clamped by said jaws, and means for drawing the jaws into clamping position and deforming said member.

3,963,231

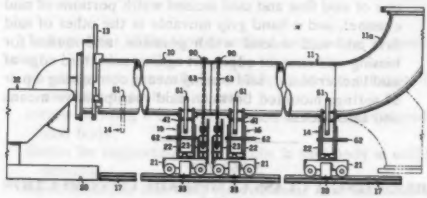
PIPE POSITIONING, ROTATING AND FITTING APPARATUS FOR WELDING

Cleveland N. Cooper, Kirkwood, Mo., assignor to The Pandjiris Weldment Co., St. Louis, Mo.

Filed Nov. 25, 1974, Ser. No. 526,708

Int. Cl.[2] B25B *1/20*

U.S. Cl. 269—45 5 Claims



1. In an apparatus for supporting and rotating two pipes for welding adjacent ends thereof, an improved support means for aligning said adjacent ends comprising:

a. a support unit including:
   1. base means, and
   2. support means carried by the base means and including a pair of transversely spaced support rolls engageable by one of said adjacent pipe ends, and
   3. clamping means carried by the base means and including means disposed about said one pipe end for applying a transverse force to said pipe end tending to urge said end into engagement with the support rolls and tending to deform said end relative to said other pipe end to align said pipe ends for welding,

b. the clamping means including means embracingly disposed about the pipe and having opposed ends, and first and second connection means connecting said ends to said base means at transversely spaced points on said base means, and

c. one of said connection means including saddle means carried by the base means, lever means pivotally mounted to the saddle means and connected to one end of said pipe embracing means in spaced relation from the lever

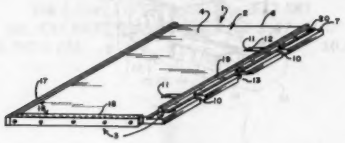
pivot axis, and cam means pivotally mounted to the saddle means and slidably engageable with the lever means upon pivotally movement of the cam means to rotate said lever means and apply a pull to said one end of said pipe embracing means.

3,963,232

TILE BOARD FOR CONSTRUCTING CERAMIC TILE SHEETS

John R. Rumpf, 9233 Litzsinger, St. Louis, Mo. 63144

Filed Oct. 4, 1974, Ser. No. 512,127
Int. Cl.² B25B *11/02*
U.S. Cl. 269—254 CS 8 Claims



1. A device for aligning a plurality of ceramic tiles to facilitate the application of adhesive grout between adjacent tiles, comprising:

a generally rectangular backer board having at least four edges, an upper surface and a lower surface, said backer board having a channel in it, said channel having a first width along said upper surface, and a second width along the lower surface of said backer board; and

lip means extending above at least three of said edges, said lip means including:

a stationary retaining means attached to two adjacent edges of said backer board; and

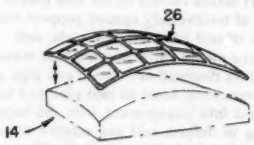
manipulative means movably mounted to said backer board along a third edge, said manipulative means comprising a straight edge part, a follower movable in one of said first and said second width portions of said channel, and a hand grip movable in the other of said first and said second width portions, and means for biasing said straight edge part against said third edge of said backer board, said biasing means comprising a pair of springs mounted between said manipulative means and said backer board.

3,963,233

FABRICATING A GLASS LAMPSHADE CONSTRUCTION FORM

Howard L. Worden, P.O. 271, Granger, Wash. 98932

Division of Ser. No. 387,929, Aug. 13, 1973, Pat. No. 3,872,574. This application Nov. 13, 1974, Ser. No. 523,510
Int. Cl.² B23P *17/00*; B23Q *3/00*
U.S. Cl. 269—289 R 6 Claims



1. A method of constructing a partial lampshade construction form, comprising:

producing an original form which reflects the desired shape of the shade, and

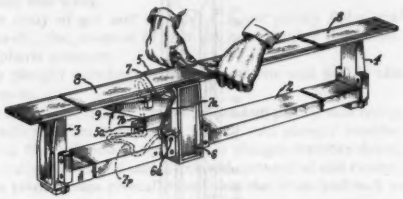
producing from the original form at least one segment defining a partial form which is an integer portion of the original form whereby an integer number of segments identical to said partial form may be joined together to reproduce the shape of the original form.

3,963,234

SKI CLAMPING APPARATUS

Leonard M. Bejtlich, 4 Martha Lane, Lenox, Mass. 01240

Filed Feb. 4, 1975, Ser. No. 546,870
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—296 16 Claims



1. A ski clamping apparatus for holding a ski in position to facilitate scraping and waxing thereof comprising an oblong support base, a first block and a second block, said blocks being mounted in fixed position respectively adjacent the extreme opposite ends of said base with predetermined portions of the blocks extending upward from one surface of the support base, the predetermined portion of each of said blocks extending upward from the support base being shaped to define a generally flat ski supporting surfact at its uppermost extremity, said generally flat ski supporting surfaces together being operable to support a ski thereon above the support base, a latching means pivotally mounted on the support base to pivot relative to said surface of the support based adjacent the mid-point thereof for engaging a portion of a ski binding on a ski supported on said blocks and for holding the ski in tension bent against its camber on the generally flat surfaces of said blocks, said latching means being pivotable from a first position adjacent said surface on the support base to a second position wherein it is operable to engage a portion of a ski binding on a ski supported on said blocks thereby to hold the ski on the generally flat surfaces of said blocks.

3,963,235

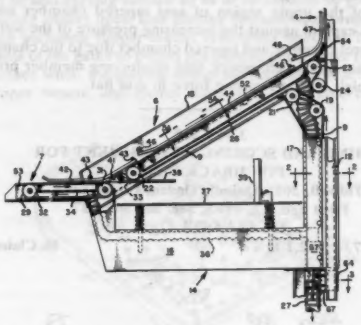
ADJUSTABLE FEED LEVEL FOR SORTING DEVICE

Donald L. Snellman, and Wade C. Vaughn, both of Seattle, Wash., assignors to Norfin, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 297,357, Oct. 13, 1972. This application July 23, 1973, Ser. No. 381,983
Int. Cl.² B65H *29/16*
U.S. Cl. 271—64 27 Claims

1. In combination with a sheet sorting device; a sheet conveyor system for receiving and transporting sheets to receiver bins, said conveyor system including conveyor belt means having a generally vertical run, an infeed section associated with said vertical run, and having guide means for first directing said belt means away from the direction of said vertical run along a lower run and then in a reverse direction along an

upper run to return to said vertical run, said upper run being adapted to receive incoming sheets to the conveyor system,



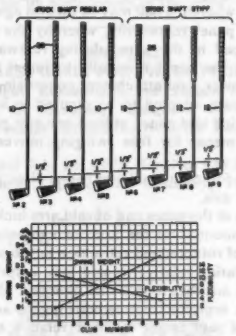
and means mounting said infeed section for vertical reciprocating adjustment along the vertical run of the belt means.

3,963,236

GOLF CLUB SET AND METHOD OF MAKING

Robert S. Mann, P.O. Box 2615, Ormond Beach, Fla. 32074

Filed Aug. 24, 1970, Ser. No. 66,186
Int. Cl.² A63B *53/00*
U.S. Cl. 273—77 A **27 Claims**



1. A matched and correlated set of successively numbered golf irons including at least the series from the No. 2 iron to the No. 9 iron in which the lowest numbered iron has a determinable swing weight, and in which each successively higher numbered iron has a greater swing weight than the preceding iron from the lowest to the highest numbered iron in the set.

27. A method for producing a matched and correlated set of successively numbered golf irons including at least the series from the No. 2 iron to the No. 9 iron wherein the clubs decrease in length and increase in loft angle from the lowest numbered iron to the highest numbered iron in the set which comprises the steps of:

a. providing a series of shafts decreasing substantially uniformly in length to attain the proper finished total length for each iron and the said shafts further having uniformly decreasing flexibility from the lowest to the highest numbered iron in the set;

b. providing a series of successively numbered heads from the lowest to the highest number in the set and making each successive higher numbered head heavier than the preceding head by an amount sufficient to increase the swing weight in substantially uniform increments from the lowest to the highest numbered iron in the set;

c. attaching the shaft of greatest length and flexibility to the lowest numbered head;

d. attaching the shaft of next lower flexibility and length to the next higher numbered head, and

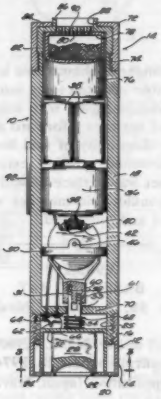
e. repeating the procedure of steps (c) and (d) until all of the shafts have been attached to their respective heads.

3,963,237

HAND-HELD POWER CUE STICK CHALKER AND TALCUM POWDER DISPENSER

Todd E. Bushberger, 8429 W. Mitchell, West Allis, Wis. 53214

Filed Sept. 23, 1974, Ser. No. 508,298
Int. Cl.² A63D *15/16*
U.S. Cl. 273—19 **3 Claims**



1. Apparatus of the type described comprising, in combination,

an elongated, generally tubular body having a longitudinal axis and opposite axial ends,

means defining a first opening in one of said axial ends of said body;

means for supporting a chalk cube in said body at said first opening,

drive means in said body spaced along said axis from said chalk cube and connected to said chalk cube for oscillating said chalk cube through a prescribed arc which forms a substantially rectilinear path in a plane generally perpendicular to said axis so that cue chalk is transferred to the end of a cue stick engaged with the chalk cube,

an electric battery arrangement in said body connected to and supplying the power source for said drive means,

means defining a second opening in said body spaced longitudinally on said body from said first opening,

means at said second opening defining a chamber for storage of talcum powder and including means for selectively opening and closing said second opening for selectively dispensing talcum powder from said chamber,

said means for supporting said chalk cube being further operative to support said chalk cube for movement in an axial direction and generally perpendicular to the plane of oscillatory movement of the chalk cube,

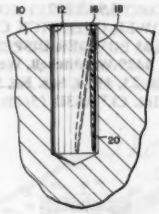
and switch means in said body associated with said chalk cube, connected in the electrical circuit of said battery arrangement and said drive means, and responsive to movement of said chalk cube in said axial direction in response to cue stick engagement with and disengagement from the chalk cube to complete and open the electrical circuit to said battery source.

3,963,238

BOWLING BALL AND GRIPPING DEVICE

Jerry M. Patrignani, N. Tarrytown, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 6, 1975, Ser. No. 629,372
Int. Cl.² A63B 37/00
U.S. Cl. 273—63 A 8 Claims



1. A bowling ball finger or thumb hole insert, comprising an elongated rigid member adapted to be inserted into said hole, spring means in communication with said member whereby said member is urged between a forward and relaxed position extending generally diagonally of said hole and a rearward, compressed and tensioned position extending substantially parallel with the inner wall surface of said hole, said finger or thumb adapted to contact said member whereby said spring means is compressed and tensioned.

3,963,239

BASEBALL BAT

Hirokazu Fujii, No. 59, 2-chome, Obiraki-cho, Fukushima, Osaka, Japan

Continuation-in-part of Ser. No. 237,390, March 23, 1972, abandoned. This application June 28, 1974, Ser. No. 484,348
Claims priority, application Japan, Mar. 23, 1973, 46-20827; June 6, 1971, 46-56014
Int. Cl.² A63B 59/06
U.S. Cl. 273—72 A 5 Claims

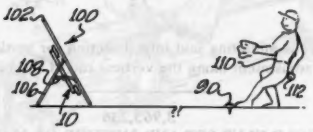
1. A substantially hollow metallic ballbat having a high impact resistance and being adapted to a change in weight, center of gravity and repelling force which comprises a generally cylindrical barrel portion defining a generally cylindrical barrel chamber and a generally cylindrical handle portion defining a generally cylindrical handle chamber, said barrel portion and its associated chamber being larger in diameter than said handle portion and its associated chamber, respectively, said barrel portion being connected to said handle portion by a tapered intermediate portion which contains a tapered intermediate chamber which connects said barrel chamber with said handle chamber, and said barrel portion having an open end, a closure means removably disposed in the open end of said barrel portion and a hard, rigid, lightweight, high impact resistant, coiled, cylindrical reinforcing member removably disposed inside said barrel chamber and extending substantially the entire length of said barrel chamber and into the upper region of said tapered chamber, the outer periphery of said reinforcing member being in tight engaging relationship with the wall of the barrel chamber and the wall of the upper region of said tapered chamber and tending to expand against the increasing pressure of the walls of said barrel chamber and tapered chamber due to the changing diameter of said chambers, said reinforcing member producing a high impact resisting force in said bat.

3,963,240

AIMING AND SCORING ATTACHMENT FOR PITCHBACK NETS

Lynn W. Tidwell, 3056 Quincy, Ogden, Utah 84403

Filed Feb. 12, 1975, Ser. No. 549,137
Int. Cl.² A63B 71/00
U.S. Cl. 273—102.1 C 16 Claims



1. An aiming and scoring attachment for a baseball pitchback device comprising an open frame having a central opening therethrough, and elastically deflectable panel spanning said opening and secured about its perimeter to said frame, and means for supporting said frame in a generally upright position of use, wherein a ball may be thrown against the panel to deflect the panel rearwardly, whereby the elastic strain energy developed in the panel during rearward deflection thereof returns the panel forwardly to impel the ball back toward the thrower, said attachment comprising:

mounting means adapted to be secured to said pitchback device behind said panel, at least one arm pivoted on said mounting means for free swinging movement about a given axis,

spring means for urging said arm in one direction of rotation about said axis,

target means at the outer end of said arm including a target member mounted on the arm for extension in said one direction of rotation and retraction in the opposite direction of rotation relative to said arm, a spring for urging said target member in said one direction of rotation relative to the arm, and annunciator means actuated by retraction of said target member relative to the arm to produce a signal, and

limit stop means for limiting swinging movement of said arm in said one direction of rotation to a normal position wherein said target member is disposed to be located adjacent the rear side of said panel and limiting swinging movement of said arm in said opposite direction of rotation to a retracted position in a manner such that impact of a ball with said panel opposite said target member deflects the panel rearwardly to actuate said annunciator means and drive said arm rearwardly toward its retracted position to permit sufficient deflection of the panel to return the ball toward the thrower.

3,963,241

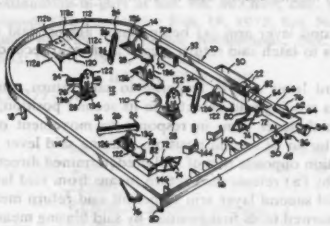
GAME APPARATUS WITH SOUNDING DEVICE

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Division of Ser. No. 325,584, Jan. 22, 1973, Pat. No. 3,884,472. This application Feb. 18, 1975, Ser. No. 550,205
Int. Cl.² A63F 7/00, 7/10
U.S. Cl. 273—121 R 4 Claims

1. In a pinball type game, or the like, which includes means defining a playing surface over which a playing object may be

propelled, a playing object to be propelled upon said playing surface, a playing object propelling device located in proximity to said playing surface so as to be capable of propelling a playing object upon said playing surface, said propelling device including flipper means selectively operable by participants of the game to propel the playing object over the playing surface when the playing object moves into contact with said flipper means, and means selectively actuatable by participants of the game and operatively connected to said flipper means to operate the same, the improvement in said propelling device comprising sound means distinct from the operative connection between said means selectively actuatable by participants of the game and said flipper means, and means operatively connecting said sound means to said means selectively actuatable by participants of the game for rendering an audible sound in response to actuation of said means selectively actuatable by participants of the game.



3,963,242

CHESS GAME FOR THREE PEOPLE

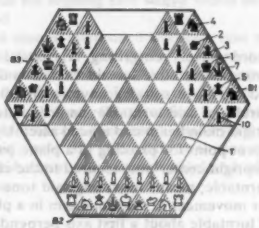
Andreas Treugut, Rothenbach, and Jurgen Bottcher, Nurnberg, both of Germany, assignors to Modell-System-Beratung Dietmar Stegmann, Heinrich Koller, Nurnberg, Germany

Filed Feb. 10, 1975, Ser. No. 548,870

Claims priority, application Germany, Feb. 11, 1974, 2406462

Int. Cl.² A63F *3/02*

U.S. Cl. 273—131 L **5 Claims**



1. A chess game for three persons comprising means having a hexagonal playing surface with three shorter and three intermediate, alternating longer sides, said surface being divided into triangular playing fields of two alternate colors, three sets of chessmen including pawns and officers, the length of the shorter sides of the playing surface being four times the lateral length of the triangular playing fields and serving as groundlines for the three players, the length of said longer sides being five times the lateral length of the triangular playing fields, there being blank portions without triangular playing fields along said longer sides so that the playing surface consists of one-hundred and six playing fields, each set of chessmen including nine of said officers and nine of said pawns, eight officers being the same as in conventional chess and the ninth officer having a shape that is different from all other of said chessmen.

3,963,243

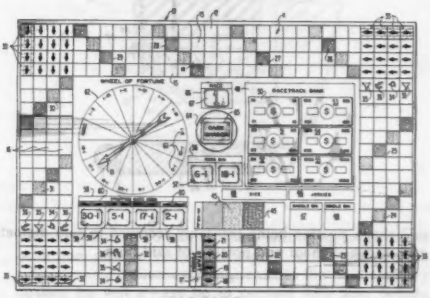
HORSE RACING BOARD GAME APPARATUS

Jerry Contento, 622 W. New York Ave., Somers Point, N.J. 08244

Filed Sept. 3, 1975, Ser. No. 609,926

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 CH **9 Claims**



1. A horse racing game comprising a game board having a marginal race track area thereon, said race track area divided into plural racing lanes for a corresponding number of race horse game pieces, said racing lanes each divided into a multiplicity of substantially equal size spaces, certain spaces of each lane having penalty indicia thereon and certain spaces having award indicia thereon, each race horse game piece comprising a race horse simulating body portion and accessory elements mounted detachably on said body portion, whereby movement of race horse game pieces onto said penalty and award indicia of the racing lanes during playing of the game may result in the loss or regaining of said accessory elements by players.

3,963,244

PENDULUM PUTTER

Henry Mierzejewski, 51 Broadview Terrace, Pittsfield, Mass. 01201

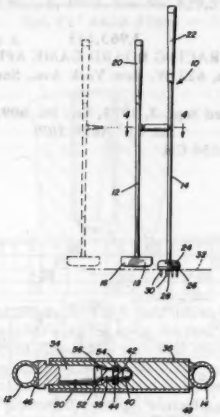
Filed Feb. 27, 1975, Ser. No. 553,646

Int. Cl.² A63B *53/00*

U.S. Cl. 273—162 R **7 Claims**

1. A pendulum putter comprising a pair of first and second generally straight upstanding shaft members disposed in side-by-side horizontally spaced apart relation, the lower end of one said shaft members including a putter head having a ball striking surface facing in a direction at substantially right angles relative to a line extending between vertical mid-portions of said shaft members, the lower end of the other of said shaft members including a foot member projecting slightly below the lowermost portion of said putter head, said vertical mid-portions of said first and second shaft members including horizontally laterally outwardly projecting shank and sleeve portions, respectively, removably telescopingly and rotatably engaged with each other for oscillation of said one shaft member relative to said other shaft member, said shank portion being generally cylindrical and including a diametrically reduced outer end portion, said sleeve portion defining an endwise outwardly opening longitudinal bore including a diamet-

rically reduced inner end portion, said shank portion being rotatably received in said bore and said outer end portion of



said shank portion being rotatably received in said diametrically reduced inner end portion of said bore.

3,963,245

APPARATUS FOR AUTOMATICALLY RETURNING A PICK-UP ARM IN A RECORD PLAYER

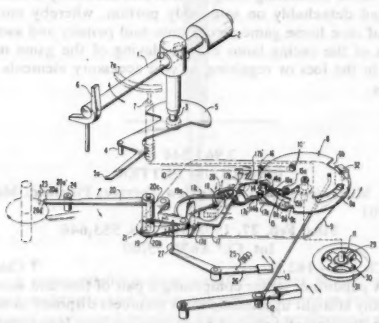
Shizuo Ishida, Tokyo, Japan, assignor to Trio Electronics Incorporated, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,861

Claims priority, application Japan, Jan. 12, 1974, 49-6839; Jan. 12, 1974, 49-6840

Int. Cl.² G11B *17/06*

U.S. Cl. 274—15 R 11 Claims



9. An automatic return apparatus for a pick-up arm of a record player, said apparatus comprising

a chassis;

return actuating means connected to said pick-up arm for rotation therewith;

return means movably mounted on said chassis responsive to said return actuating means for returning said pick-up arm to its rest position, said return means being movable from a first position at the start of play of a record to a second position and then back to said first position at end of play of said record;

biasing means for biasing said return means toward said first position;

moving means for moving said return means to said second position against the bias of said biasing means;

a lever rotatably mounted on said chassis having first, second, third and fourth lever arms;

a detector movably mounted on said chassis for detecting said end of play of the record, said detector being movable from a first detector position at the start of play to a second detector position at the end of play; and

said first lever arm being elastic and in response to said return means biasing said lever in a predetermined direction;

said second lever arm (a) being biased against said return means to latch said return means in its said second position;

said third lever arm in response to said return actuating means moving said detector to its second position;

said fourth lever arm, in response to movement of said detector to its second position, rotating said lever in the direction opposite that of said predetermined direction to thereby (a) release said return means from said latching by said second layer arm to permit said return means to be returned to its first position by said biasing means and (b) cause said third lever arm to return said detector to its first position.

3,963,246

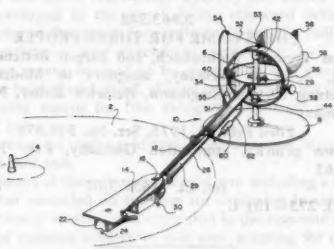
TONE ARM FOR RECORD PLAYER

Jaroslav George Trochimowski, 100 Gamble Ave., Apt. 910, Toronto, Ontario M4K 2H2, Canada

Filed May 7, 1975, Ser. No. 575,473

Int. Cl.² G11B *3/38*

U.S. Cl. 274—23 R 13 Claims



1. In a record player comprising: a chassis; a turntable mounted for rotation relative to said chassis and adapted to carry a record having a spiral groove; a spindle extending upwardly centrally of said turntable; an articulated tone arm comprising a rigid main beam and a head assembly connected thereto at a pivot point for pivoting in a plane parallel to the turntable; an upright center post secured to the chassis at one side of said turntable; means mounting said tone arm on said center post for movement of said tone arm in a plane perpendicular to the turntable about a first axis perpendicular to the center post and in a plane parallel to the turntable about a second axis through said center post; pick-up means including a stylus, said pick-up means being carried by said head assembly with said stylus to track the spiral groove of a record on the turntable; and control means for moving said head assembly along a curved path such that the path in which the stylus vibrates extends along a radius of said turntable, the improvement wherein said control means comprises a bearing plate fixed to said head assembly at a predetermined angle and a rigid linkage means spaced beside said main beam, one end of said linkage means secured at a point spaced from said center post for pivoting in a plane parallel to the turntable, said linkage means being of predetermined length such that its other end slidably contacts said bearing plate to provide proper orientation of the head assembly during record play,

and means extending between said linkage means and said main beam, intermediate the ends thereof, to co-ordinate pivotal movement of said linkage means with that of said main beam.

3,963,247

SHAFT SEAL

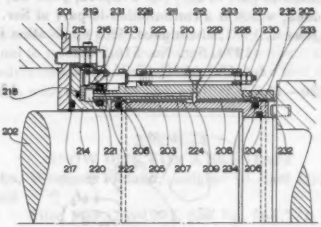
Johan P. Nommensen, Stein, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 203,689, Dec. 1, 1971, abandoned. This application Feb. 19, 1975, Ser. No. 551,298

Claims priority, application Netherlands, Dec. 1, 1970, 7017502; Dec. 1, 1970, 7017503

Int. Cl.² F16J *15/40*

U.S. Cl. 277—16 **8 Claims**



1. A sealing arrangement for a rotatable shaft which projects through a wall comprising:

a sleeve mounted on said shaft for rotation therewith;

a stator member arranged concentrically about said sleeve, fixed to prevent rotation thereof and guided for limited axial movement relative to said sleeve;

said sleeve having helical windings on the outer surface thereof in spaced relationship from the stator member such that will produce a hydraulic pressure between said sleeve and said stator member sufficient to produce axial movement of said stator member by action of said fluid on a surface of said stator member presenting an area perpendicular to said shaft, when said sleeve is rotated;

a thin layer of material sprayed on said sleeve at the ends of the windings so as to reduce the spaced relationship at said ends for aligning said sleeve within said stator member; and

static seal means interposed between said stator member and said sleeve for sealingly engaging said stator member and said sleeve when said sleeve is at rest;

spring means biasing said stator member in an axial direction opposite from the direction of movement of said stator memmber in response to said hydraulic pressure of said fluid, whereby said static seal means sealingly engages said stator member and said sleeve when said sleeve is at rest.

3,963,248

UNITIZED DUAL LIP SEAL

Dean R. Bainard, Clover, S.C., assignor to Garlock Inc., Palmyra, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,205

Int. Cl.² F16J *15/38, 15/54*

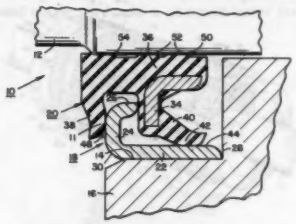
U.S. Cl. 277—92 **17 Claims**

1. A unitized bore seal for providing a seal between a housing and a shaft extending through a bore in the housing comprising:

a. an annular wear sleeve for use on one of a bore and shaft, and having a radial flange extending toward the below-recited elastomeric member,

b. an annular, at least partly elastomeric member for use on the other of a bore and shaft, said member having a cylindrical portion and an auxiliary radial portion including an auxiliary sealing lip extending radially toward said wear sleeve on the outside of said radial flange, and extending into contact with the outside radial surface of said radial flange, and said member having a main radial portion extending radially toward said wear sleeve on the other side of said radial flange and including a main sealing lip,

c. said annular wear sleeve including a cylindrical flange connected to the distal end of said radial flange, said cylindrical flange extending into contact with said main



radial portion when said auxiliary sealing lip is in contact with the outside radial surface of said radial flange, whereby said cylindrical flange ensures that said auxiliary sealing lip will always be in contact with said outside radial surface of said radial flange, whereby said auxiliary sealing lip seals and also prevents formation of a pocket of contaminant and encourages water drainage to wash sludge away from the auxiliary sealing lip, and

d. the distal end of said radial flange being closer to said cylindrical portion of said elastomeric member than are the distal ends of said lips, whereby said seal is unitized.

3,963,249

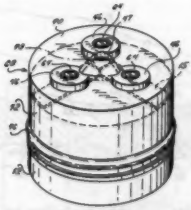
CHUCK SEAL

Anton Fink, 149 Crescent Drive, Albertson, N.Y. 11507

Filed May 21, 1975, Ser. No. 579,414

Int. Cl.² B23B *31/20*

U.S. Cl. 279—1 ME **10 Claims**



1. For a chuck having movable jaws:

an elastomeric cover adapted to fit about the chuck with said cover having an integral skirt;

aperture means in said cover with each one thereof substantially in registration with a respective jaw of the chuck;

means received in each of said apertures to effect a localized sealing of same on a respective chuck jaw and adapted to hold the workpiece; and,

means to seal the skirt perimetrically on the chuck, thereby to isolate the chuck from the ambient environment while permitting movement of the jaws.

3,963,250

CHUCK

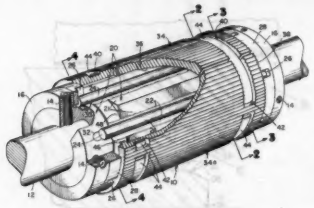
Richard Edward Flagg, E. Bridgewater, Mass., assignor to Double E Company, Inc., Brocton, Mass.

Continuation-in-part of Ser. No. 240,435, April 3, 1972, Pat. No. 3,792,868. This application Aug. 24, 1973, Ser. No. 391,327

The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl.² B23B *31/40*

U.S. Cl. 279—2 R 15 Claims



1. In a core chuck comprising an interior member having a longitudinal axis and including a plurality of generally planar exterior surfaces each parallel to said axis, a plurality of rollers, each roller parallel to and in contact with one of said generally planar surfaces, a plurality of jaw members, each jaw member having an arcuate interior surface in contact with at least one of said rollers, and means for resiliently maintaining said jaw members in contact with said rollers, the improvement comprising the provision of jaw orientation means which limit the relative rotational movement, around said axis, between a jaw member and an underlying roller, said jaw orientation means comprising a lug secured to said jaw member and projecting inwardly from the inner surface of said jaw member.

3,963,251

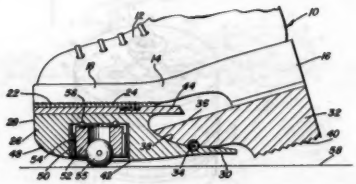
ARTICULATED SHOE SOLE WITH UNIVERSAL SUPPORTIVE WHEEL

Paul P. Miano, Box 246 - Church St., Garyville, La. 70051

Filed July 1, 1975, Ser. No. 592,324

Int. Cl.² A63C *17/08*

U.S. Cl. 280—11.1 BR 7 Claims



1. In combination, a shoe including an upper and an underlying flexible sole having front and rear toe and heel portions, a first body attached to and underlying the under surface of said toe portion and including front and rear marginal portions, a second body including front and rear marginal portions underlying said heel portion for abutment therewith, attaching means removably stationarily attaching said first body to said toe portion, pivot means pivotally attaching the front marginal portion of said second body to the rear marginal portion of the first body for limited pivotal movement of said second body relative to said first body about a fixed horizontal transverse axis, spring means connected between said bodies yieldingly urging said second body, in an angular direction relative to said first body, to swing said second body, rearward of said axis, upwardly into abutting engagement with said heel portion, said first body including a single downwardly facing bearing member journaled from said first body for rotation about a horizontal axis as well as an upstanding axis, said second body including at least a rear undersurface portion adapted for movement braking frictional engagement with a horizontal surface upon which said bearing member is disposed and being free of direct attachment to said shoe, whereby said shoe sole heel portion may be elevated above the upper limit of swinging movement of the rear portion of said second body.

3,963,252

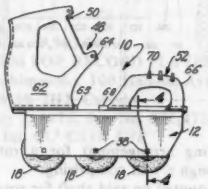
ROLLER SKATE

Ronald G. Carlson, 9524 Otis, Apt. A, South Gate, Calif. 90280

Continuation-in-part of Ser. No. 373,642, June 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 149,908, June 4, 1971, abandoned. This application Oct. 21, 1974, Ser. No. 516,595

Int. Cl.² A63C *17/06, 1/26*

U.S. Cl. 280—11.22 12 Claims



1. A roller skate comprising:

a channel shaped frame having an upper normally generally horizontal wall mounting foot receiving means, depending flanges along the longitudinal edges of the wall,

wheels between said flanges each including an axle having ends engaging in slots entering the inner surfaces and opening longitudinally through the bottom edges of said flanges,

compression springs in said slots above said axle ends for yieldably urging said axles downwardly in the slots,

said slots entering the inner surface of said flanges to a depth less than the thickness of said flanges, whereby said flanges position said axles endwise,

retainer bars extending along said bottom edges and overlying the lower open ends of said slots for releasably retaining said axles in their slots, and

means securing said retainer bars to said flanges for movement of the bars to and from axle retaining positions, wherein the bars close the lower ends of said slots to retain the wheel axles in the slots as well as to permit removal and replacement of said wheels.

3,963,253

SAFETY SKI BINDING

Hermann Rieger, Immenstaad, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH, Germany

Filed May 13, 1974, Ser. No. 469,674

Claims priority, application Germany, May 12, 1973, 2324078; Jan. 15, 1974, 2401729

Int. Cl.² A63C *9/085*

U.S. Cl. 280—616 49 Claims

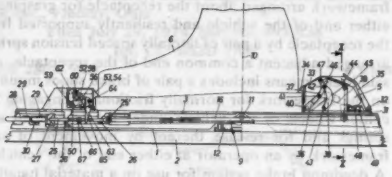
1. Safety ski binding apparatus comprising:

a first plate fixedly securable to a ski,

a second plate spaced from said first plate,

resilient connecting means connecting said first and second plates to one another while permitting movement of said second plate relative to said first plate about at least one

vertical and at least one horizontal axis against the force of resilient members of said resilient connecting means, ski boot securing means for releasably securing a ski boot to said second plate, said securing means including means responsive to a release signal for effecting an automatic release of said ski boot from said second plate,



and release signal generating means for generating a release signal to release said securing means in direct response to predetermined relative movement of said first and second plates with respect to one another.

3,963,254

SNOW DISK FOR A SKI STAFF

Yrjo Aho, Westend, Finland, assignor to Exel Oy, Helsinki, Finland

Filed Mar. 24, 1975, Ser. No. 561,771
Claims priority, application Finland, Mar. 28, 1974, 957/74
Int. Cl.² A63C *11/24*
U.S. Cl. 280—11.37 Z **7 Claims**

1. An asymetric disk for a ski staff with hand straps, said disk having a front edge in close proximity to the staff, at least one of the rear edge and lateral edge of said disk only extending to form the bearing surfaces of the disk, said hand straps being attached to said staff on the side of said rear edge.

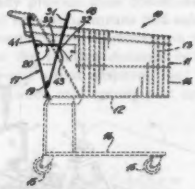
3,963,255

SHOPPING CART SEAT CONSTRUCTION

Antoine Trubiano, 36 Marien St., Montreal East 550, Quebec, Canada

Filed Apr. 4, 1975, Ser. No. 565,219
Int. Cl.² B62B *11/00*
U.S. Cl. 280—33.99 B **6 Claims**

1. In a shopping cart comprising an open-topped container having a bottom wall, spaced side walls and a front wall, an end gate forming a rear wall for said container and having leg holes in an upper portion thereof, a secondary gate pivotally connected at a lower end thereof to a fixed connecting point on said end gate below said leg holes, and a hinged seat between said gates, the improvement comprising a seat support slide member pivotally secured to a fixed connecting point at one end to said end gate to support and position said seat adjacent a lower edge of said leg holes between said end gate and secondary gate, said secondary gate being slidingly retained at opposed vertical side edges thereof in a respective end channel formed integrally with said seat support slide member whereby said secondary gate is displaceable towards and away from said end gate from its pivotally connected lower end, said seat support slide member being formed by a single wire defining a pair of spaced apart side members and said end channels, said side members being pivotally connected at said one end to said end gate, said seat being supported between said spaced apart side members, each said end channels being formed by an angulated generally U-shaped bend in said single wire, and a common outer arm extending



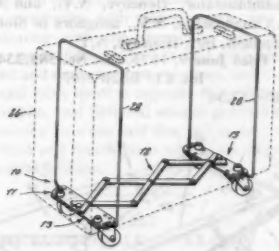
transversely to the longitudinal axis of said secondary gate between said end channels and outside said secondary gate, each said channels lying in a plane angulated from the longitudinal axis of said side members and defining opposed arms to receive a respective vertical side edge of said secondary gate therebetween whereby to provide free sliding displacement of said channels along a predetermined length of said vertical side edges when said secondary gate is displaced on its pivoted lower end toward said rear wall, said free sliding displacement permitting said seat frame to be positioned substantially horizontal between said secondary gate and said rear wall when said secondary gate is inclined away from said end gate and to lie substantially in the same plane as said secondary gate when said secondary gate is pivoted against and rests on said rear wall.

3,963,256

LUGGAGE WHEELS

Josephine C. Stafford, 3636 N. Campbell, Apt. E-13, Tucson, Ariz. 85419

Filed May 20, 1975, Ser. No. 579,217
Int. Cl.² B62D *21/14*
U.S. Cl. 280—35 **3 Claims**



1. In a luggage carrier, the combination of a metal frame comprised of an extendable lazy tongs secured pivotally at each opposite end to a swiveling truck consisting of a flat plate having a caster wheel secured under end thereof, and means whereby said frame is securable to an underside of luggage, said lazy tongs comprising a plurality of crossing bars having a pair of long central bars pivotally attached together at their

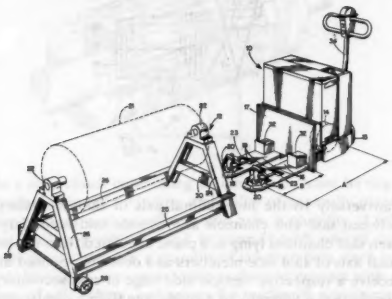
centers, and a pair of shorter bars secured pivotally at each opposite end of said longer bars, said shorter bars crossing each other near their outward ends and being freely pivotable about a rivet extending through said plate, said outward ends of said short bars being positioned to clasp a post mounted upon said plate.

3,963,257

ROLL HANDLING

Robert E. Harron, Woburn, Mass., assignor to Brodie, Inc., Woburn, Mass.

Filed Mar. 31, 1975, Ser. No. 563,739
Int. Cl.² B62D *21/18*
U.S. Cl. 280—43.12 **10 Claims**



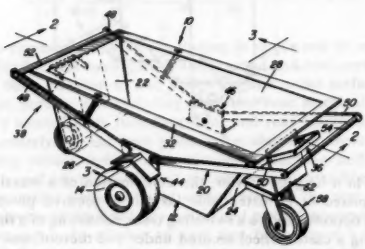
1. Carrier apparatus for elongated loads comprising,
means defining an elongated frame comprising front and rear load carrying members, rear wheels, and a transverse beam at a forward end of said frame,
means defining a tow dolly for towing said frame with a forward drive wheel and at least one rearward extension for engaging and supporting said forward transverse beam,
means defining at least one set of main and auxiliary wheels for said dolly,
means mounting said main wheels and auxiliary wheels from said extension for alternating ground contact,
and means for swivelling said auxiliary wheels.

3,963,258

MATERIAL HANDLING VEHICLE

Guthrie B. Stone, deceased, late of Honeoye, N.Y.; by Alan J. Stone, administrator, Honeoye, N.Y., and Christian T. Tertinek,Canandaigua, N.Y., assignors to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed June 9, 1975, Ser. No. 585,234
Int. Cl.² B62B *3/02*
U.S. Cl. 280—47.34 **9 Claims**



1. A material handling vehicle, comprising, in combination:
a. a load receiving receptacle;
b. a pair of spaced center wheels rotatably mounted on the receptacle for movably supporting the receptacle; and
c. brake means mounted on the receptacle for operation from either end of the vehicle and for normally frictionally engaging the center wheels and restraining the center wheels from rotation, and the brake means includes a framework arranged about the receptacle for grasping at either end of the vehicle and resiliently supported from the receptacle by a pair of laterally spaced tension springs arranged adjacent a common end of the receptacle, and said brake means includes a pair of brake shoes mounted on the framework for normally frictionally engaging the center wheels of the vehicle under the tension of said springs and for release thereof by movement of said framework by an operator at either end of the vehicle.

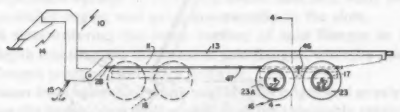
8. A deadman brake system for use on a material handling vehicle having a plurality of wheels moveably supporting the vehicle, the brake system comprising, in combination:
a. a framework arranged about a load receiving receptacle of the vehicle for operation from either end of the vehicle;
b. a pair of spaced tension springs connected to the receptacle and to the framework for resiliently supporting the framework from the receptacle, the springs arranged adjacent a common end of the receptacle; and
c. a brake shoe mounted on the framework for normally frictionally engaging a one of the wheels movably supporting the vehicle under the tension of said pair of springs and for release thereof by movement of said framework by an operator at either end of the vehicle.

3,963,259

SLIDING AXLE ASSEMBLY FOR FLAT DECK TRAILERS AND THE LIKE

Navarre A. Massey, 542 River Drive, Fort Macleod, Alberta, Canada

Filed Apr. 29, 1975, Ser. No. 572,731
Claims priority, application Canada, Oct. 22, 1974, 211924
Int. Cl.² B60G *5/06*; B62D *53/06*
U.S. Cl. 280—80 B **2 Claims**



1. In a trailer having an adjustable undercarriage which includes a double axle wheel bogie assembly; the improvement which comprises means to mount said trailer upon said undercarriage for selective sliding movement therebetween, said means including a pair of spaced and parallel tracks secured to the under of said trailer, a plurality of roller assemblies journalled for rotation upon the upper side of said undercarriage, locking means selectively cooperating between said trailer and said undercarriage to detachably lock said trailer to said undercarriage in the desired relationship, and means to retain said trailer upon said undercarriage for relative rolling movement therebetween parallel to the longitudinal axis of said trailer, said track comprising a planar longitudinally extending flange plate secured to the underside of said trailer, a longitudinally extending angle iron including a pair of side flanges and an apex portion at the junction thereof, said angle iron being secured by the side edges thereof to the underside of said flange plate thus forming a triangular configuration when viewed in cross section, said apex portion of said angle iron facing said undercarriage, said rollers having a V groove around the periphery thereof with a cross sectional configuration similar to the cross sectional configuration of said angle

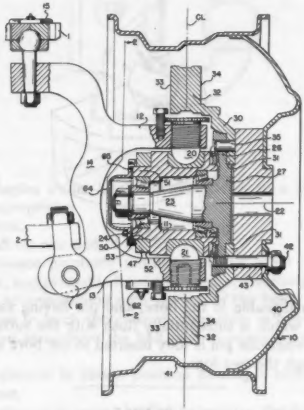
iron, said apex portion and part of said side flanges of said angle iron, engaging said grooves.

3,963,260

CENTERLINE STEERING WHEEL ASSEMBLY INCLUDING DISC BRAKE

Melvin R. Inbody, Findlay, Ohio, assignor to Diversified Interests, Inc., Findlay, Ohio

Filed July 29, 1974, Ser. No. 492,438
Int. Cl.² B62D 7/08
U.S. Cl. 280—96.3 6 Claims



1. A dirigible wheel assembly for a surface vehicle having an axle, an A frame on said axle and a steering tie rod, said assembly comprising: A hub; a wheel spindle journalled in said hub, said spindle including a circular central boss projecting from said hub, and an annular flange extending radially from said boss; a wheel member connected to said annular flange; a yoke member having parallel arms extending above and below said hub; bearing means supporting said hub on said arms for turning movement about a vertical steering axis lying in a plane normal to the center line of said hub and coincident with the vertical center line of said wheel member; an annular brake shoe member attached to said flange, said brake shoe member having an annular brake rotor presenting annular disc brake surfaces lying in vertical planes substantially equally spaced from said center line; a brake caliper assembly straddling said brake rotor, and having brake shoes for pressing against said disc brake surfaces; means for supporting said caliper assembly on said hub; means for connecting said tie rod to said means for supporting said caliper assembly; a ball-socket joint connecting said yoke to the upper end of said A frame; and a hinge joint connecting said yoke to the lower end of said A frame.

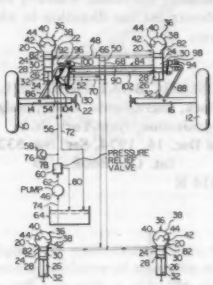
3,963,261

VEHICLE SUSPENSION SYSTEM

Mituo Hiruma, Kodaira, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 3, 1975, Ser. No. 554,493
Claims priority, application Japan, Mar. 4, 1974, 49-24581[U]
Int. Cl.² B60G 17/00
U.S. Cl. 280—683 8 Claims

1. A suspension system in a vehicle, comprising first and second retractable and extensible suspension struts each of which has therein a fluid chamber filled with pressurized fluid, each of said fluid chambers being variable in volume in response to increases and decreases in a load applied to the corresponding suspension strut to cause shortening and lengthening of the suspension strut, each of said fluid chambers being fluidly communicable with a pressurized fluid source and a fluid reservoir, and level regulating means operable to normally obstruct fluid communication between the corresponding fluid chamber and said source and between said fluid chamber and said reservoir and to provide fluid communication between said source and said fluid chamber to cause supply of pressurized fluid thereinto for lengthening of the corresponding suspension strut in response to shortening thereof and between said reservoir and said fluid chamber to cause discharge of fluid therefrom for shortening of the suspension strut in response to lengthening thereof thereby maintaining the length of the suspension strut substantially constant independently of the value of said load, control means operable to normally provide fluid communication between the respective level regulating means and said source and to obstruct fluid communication therebetween in response to a difference between the relative distance between a sprung part of the vehicle and a first unsprung part thereof and the relative distance between said sprung part and a second unsprung part of the vehicle which difference is in excess of a predetermined value, and sensing means for sensing said difference to operate said control means to obstruct fluid communication between the respective level regulating means and said source, in which said control means is further operable to normally provide fluid communication between the respective level regulating means and said reservoir and to obstruct fluid communication therebetween when said sensing means senses said difference, in which said control means comprises a control valve having a valve body formed therein with a bore, a first port communicating with said source, a second port communicating with the respective level regulating means, a third port communicating with said reservoir, and a fourth port communicating with the respective level regulating means, a valve spool slidably fitted in said bore and formed therein with first and second annular grooves, and two biasing means urging said valve spool in opposite directions to hold it in a neutral position, said first and second grooves providing fluid communication between said first and second ports and between said third and fourth ports when said valve spool is held in said neutral position.



3,963,262

TOY AUTOMOBILE APPARATUS

Gertrude Althea Estell, 10200 W. 98th St., Overland Park, Kans. 66212

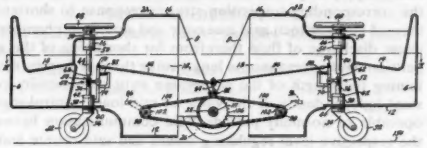
Filed May 27, 1975, Ser. No. 580,583
Int. Cl.² B62M 1/00
U.S. Cl. 280—231 9 Claims

1. A toy automobile apparatus comprising:

a. a vehicle body having seats for two persons and supported by ground-engaging drive wheels carried rotatably thereby,

b. a pair of manually operable propelling means carried by said vehicle body, each operable by a person occuping one of said seats,

c. a drive train interconnecting each of said propelling means with said drive wheels, and operable when actuated to turn said drive wheels in respectively opposite directions to propel said vehicle body in respectively opposite directions, and



d. a slipping clutch included in each of said drive trains, the output power of each of which is dependent on the force and speed with which the corresponding propelling means is manually operated, whereby one person or the other may determine the direction in which said vehicle body is driven.

3,963,263

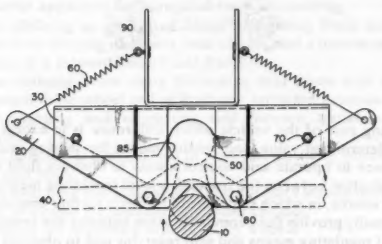
AUTOMATIC BOAT-TRAILER LATCH

Russell U. Whitlock, Sacramento, Calif., assignor to The Raymond Lee Organization, New York, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,933

Int. Cl.² B60P *3/10*

U.S. Cl. 280—414 R **2 Claims**



1. A boat latch, comprising:

attached to a trailer bow post, a latch body forming a recess for receiving a boat bow eye,

a striker pivotally mounted on the latch body at a forward end of the body which forms the recess,

stop means of limiting the closing movement of the striker mounted on the latch body, and

means of restraining the striker in the closed position yieldable to the boat bow eye and attached to the striker and the trailer bow post.

3,963,264

DUAL PURPOSE TRAILER TOWING ATTACHMENT

Dennis Llewellyn Richard Down, Elwell Farm, Diptford, Totnes, Devon, England

Filed Jan. 23, 1975, Ser. No. 543,599

Claims priority, application United Kingdom, Jan. 23, 1974, 3046/74

Int. Cl.² B60D *1/02*

U.S. Cl. 280—415 A **9 Claims**

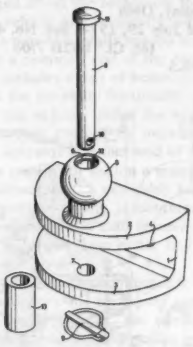
1. A dual purpose trailer towing attachment comprising:

a support plate;

two parallel flat lugs which, when the plate is mounted vertically on a towing vehicle, project rearwardly from the plate and are spaced apart one above the other in respective horizontal planes;

an upstanding boss welded to the upper lug and projecting from the upper surface thereof, said boss being adapted to receive a socket towing fitting of a tow-bar;

means defining a bore extending through the centre of the boss and through the two lugs, and



a pin engageable in the bore, said pin having an enlarged head which is substantially flush with the surface of the boss when the pin is fully inserted in the bore and passes through the two lugs.

3,963,265

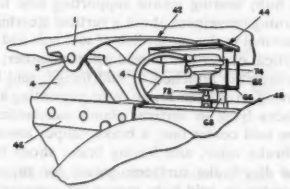
ANTI-JACKKNIFE MECHANISM

Robert E. Kornoelje, Wyoming, and Dale Van Der Kolk, Hudsonville, both of Mich., assignors to Robert E. Kornoelje, Wyoming, Mich.

Filed June 5, 1975, Ser. No. 584,137

Int. Cl.² B62D *53/08*

U.S. Cl. 280—432 **9 Claims**



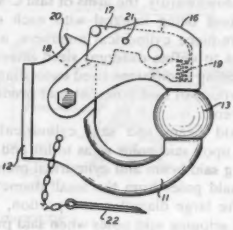
1. For use with a fifth wheel coupler and kingpin between a towing tractor and a towed trailer, anti-jackknife apparatus for attachment to a fifth wheel coupler having a bearing plate, locking coupler jaws, and a shaft shiftable forwardly during coupling, comprising:

support structure with mounting means for attachment to the front of a fifth wheel coupler; a stop member shiftable normal to the coupler bearing plate, between a lowered inoperative position and a raised operative position; abutment means mountable to a trailer on opposite sides of the kingpin for engagement by said stop member in its raised position, biasing means for biasing said stop member to said raised operative position; latch means for restraining said stop member in said lowered inoperative position; latch trip means for said latch means for tripping said latch means and thereby enable said biasing means to shift said stop member to said raised operative position, said tripping means including shaft engaging means for actuation of said tripping means by the shiftable shaft.

3,963,266
DUPLEX TRAILER HITCH

Mark O. Thelin, Lackawanna Drive, R.D. 2, Stanhope, N.J. 07874

Filed Sept. 9, 1975, Ser. No. 611,703
Int. Cl.² B60D 1/06
U.S. Cl. 280—504 4 Claims



1. A duplex trailer hitch for attachment to a lunette or a coupler comprising
   a. a hook,
   b. a ball on one end of the hook,
   c. a closure pivotably mounted on the other end of the hook, and pivotable from a position spaced away from the ball, to engagement with the top of the ball,
   d. means to latch the closure alternately in open position, spaced away from the ball, and in engagement with the ball,
   e. the closure in closed position holding a lunette against release,
   f. the closure in open position permitting the introduction of a lunette over the ball, and also alternately permitting a coupler to seize the ball.

3,963,267
FLUID CONNECTOR

Andre Legris, St-Maur, France, assignor to Societe Legris France S.A., Ozoir-la-Ferriere, France

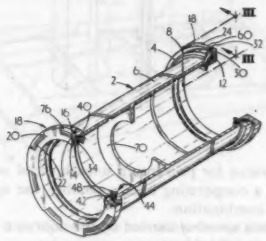
Filed May 20, 1974, Ser. No. 471,591
Claims priority, application France, June 5, 1973, 73.20453
Int. Cl.² F16L 17/02
U.S. Cl. 285—93 15 Claims

1. A pipe joint comprising a longitudinally extending pipe having an internal bore and having at least one peripherally continuous, peripheral groove adjacent, but spaced from, an end thereof to provide a peripherally continuous throat adjacent said end and of a diameter less than the diameters of the outer surface of a first portion of said pipe intermediate said throat and said end and the outer surface of a second portion of said pipe on the side of said throat longitudinally opposite from said first portion and a longitudinally extending, releasable connector around said pipe at said end thereof, said connector comprising a body member having an internal bore and extending around both said first portion and said second portion of said pipe and having a flared internal surface portion overlying at least one of said groove and said second portion, said flared surface portion decreasing in diameter in a direction away from said end of said pipe, a plurality of individual, separately flexible jaws mounted in side-by-side peripherally spaced relation around the periphery of said pipe and intermediate said body member and said pipe, said jaws having inwardly extending projections extending into said groove to prevent longitudinal movement of said pipe with respect to said body member, said jaws abutting against said flared portion to prevent outward movement of said jaws and said jaws being longitudinally slidable with respect to said body member and having a portion extending outwardly from said body member to permit manual movement thereof inwardly of said body member, and an O-ring of flexible material intermediate said body member and said first portion of said pipe for providing a fluid seal therebetween.

3,963,268
PIPE COUPLINGS

Derek Gordon Widdicombe, Huddersfield, England, assignor to Naylor Brothers (Clayware) Limited, Huddersfield, England

Filed Jan. 28, 1975, Ser. No. 544,893
Claims priority, application United Kingdom, Jan. 31, 1974, 4552/74
Int. Cl.² F16L 21/02
U.S. Cl. 285—230 9 Claims



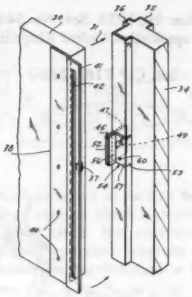
1. A pipe coupling for plain-ended pipes, comprising
   a tubular open-ended sleeve of synthetic material provided on at least one end with a plurality of spaced tongues extending substantially parallel to the longitudinal axis of the sleeve,
   each tongue being formed with a projection which extends beyond the body of the tongue,
   each projection also extending transversely to the corresponding tongue in a radial direction with respect to the longitudinal axis of the sleeve,
   a clamping ring formed with spaced through apertures in which the tongues of said end of the sleeve are adapted to extend,
   said apertures being wide enough in a radial direction relative to the longitudinal axis of the sleeve for the clamping ring to be push-fitted on the tongues by movement of the clamping ring towards said end of the sleeve during which the projections enter the apertures first,
   said clamping ring having a face portion facing away from said sleeve,
   each projection having a face portion facing towards the other end of the sleeve and abutting against said face portion of said clamping ring,
   said abutting face portions being in substantially the same plane and extending substantially perpendicular to the longitudinal axis of the sleeve whereby movement of the clamping ring along the said longitudinal axis in a direction away from the sleeve is prevented,
   said end of said sleeve and said clamping ring defining between them an annular recess,
   and a sealing ring of rubber-like material clamped in said annular recess between said clamping ring and said end of said sleeve,
   each sealing ring comprising a collar and an annular beading attached to the collar and extending around an inside of the sleeve for engaging an end of a pipe inserted into the sleeve through said end of said sleeve.

3,963,269

SECURITY DEVICE

Sheldon R. Rosenberg, 2066 E. 23rd St., Brooklyn, N.Y. 11229

Filed July 25, 1974, Ser. No. 491,934
Int. Cl.² E05B 17/00
U.S. Cl. 292—346 8 Claims



1. Apparatus for preventing unauthorized separation of a door from a cooperating buck assembly, the apparatus comprising, in combination:

a first plate member carried by the door and extending in a plane parallel thereto;

locking means separate from said first plate member for securing the door to the buck assembly, the locking means being carried by said door in spaced relationship with said first plate member;

a second plate member affixed directly to the buck assembly and extending in a plane transverse to the door, the second plate member having an anti-tampering portion projecting beyond the edge of the buck assembly toward the first plate member;

a Z-shaped support element separately affixed directly to the buck assembly in juxtaposition with the second plate member, the support element including an edge flange in parallel abutting relationship with said anti-tampering portion and an intermediate flange parallel to the first plate member and rigidly affixed to the buck assembly; and

means on one of the plate members for receiving the other plate member when the door is closed, the plate members cooperating with each other in the door's closed position to prevent movement of the door in its plane.

3,963,270

APPARATUS FOR LIFTING UP AND CARRYING CONCRETE POLES

Takumitsu Mori, Hachioji, and Masao Tanaka, Kamakura, both of Japan, assignors to Nippon Concrete Industries Co. Ltd., Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,371
Int. Cl.² B66C 1/62
U.S. Cl. 294—81 R 9 Claims

1. Apparatus for lifting up and carrying concrete poles which are tapered in the longitudinal direction so as to define small diameter end portions of said poles and large diameter end portions of said poles, comprising:

a longitudinal beam; and

a plurality of cylindrical members dependingly supported from said beam and spaced along said beam in the longitudinal direction, at predetermined positions thereof, so as to define predetermined distances between successive cylindrical members;

each of said cylindrical members being substantially C-shaped in cross-section with the open portion thereof disposed downwardly, the arms of said C-shaped cylindrical members being integral with each other, so as to define one-piece cylindrical members, and of different sizes so as to define different sized internal open areas, corresponding to different sized outer diameter cross-sectional portions of said poles, at said predetermined positions thereof,

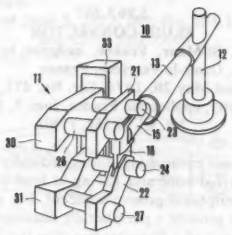
whereby said beam and said cylindrical members are mounted upon said poles so as to lift and carry the same by moving said beam and cylindrical members longitudinally of said poles from the small diameter end portion toward the large diameter end portion, said cylindrical members gripping said poles when said particularly sized cylindrical members correspond to the particularly sized cross-sectional portions of said poles at said predetermined positions thereof.

3,963,271

FINGER MECHANISMS OF INDUSTRIAL ROBOTS

Yoshide Sugino, Kamakura; Nobuo Okonogi, Chigasaki, and Shinsaku Nokagawa, Yokohama, all of Japan, assignors to Yamatake-Honeywell Company, Limited, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,452
Int. Cl.² B25J 15/00; F16F 9/00
U.S. Cl. 294—86 R 12 Claims

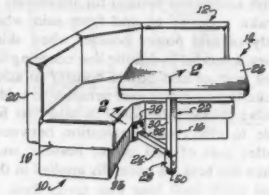


1. In a finger mechanism of an industrial robot of the type comprising a plurality of fingers for clamping an article to be manipulated, a drive source for opening and closing said fingers, a mounting bar for supporting each of said fingers, and cushion mechanisms interposed between respective fingers and said mounting bar, thereby preventing undue forces applied to said fingers from transmitting directly to said mounting bar, the improvement wherein each cushion mechanism comprises a hollow cylindrical housing, a cylinder contained in said housing and extending in the axial direction thereof, a piston slidably contained in said cylinder, a piston rod connected to said piston and extending through one end of said cylinder, a nipple secured to said cylinder for admitting motive fluid into said cylinder, a first supporting member for yieldingly supporting the opposite end of said cylinder by said housing, a second supporting member arranged on said one end of said cylinder for supporting said piston rod, and means for mounting a finger on the outer end of said piston rod.

3,963,272
TABLE WITH ADJUSTABLE FOOT

Ferris E. Jones, 943 Millbury Ave., La Puente, Calif. 91746

Filed Sept. 23, 1974, Ser. No. 508,074
Int. Cl.² A47B 39/00
U.S. Cl. 297—172 25 Claims

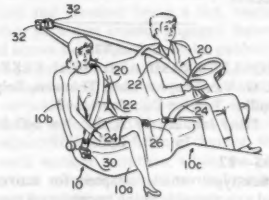


1. A table comprising:
a normally upright supporting base including a lateral mounting extension rigidly joined at one end to the base and extending laterally from the base at a permanently fixed angle relative to the base,
means at the other end of said extension for rigidly attaching said extension to a supporting structure in a permanently fixed generally horizontal position for supporting of said table in cantilever fashion by said structure with the bottom of said base spaced above the floor,
a table top mounted atop said base,
a supporting foot at the bottom of said base directly below said top, and
means mounting said foot on said base for movement relative to said base between a lower extended position wherein said foot projects below said base for supporting contact with the floor and an upper retracted position wherein said foot is raised to clear the floor to facilitate cleaning the floor below said base.

3,963,273
SEAT BELT ASSEMBLY

Yasuo Nagazumi, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 10, 1974, Ser. No. 432,339
Claims priority, application Japan, Jan. 12, 1973, 48-486852
Int. Cl.² A62B 35/00
U.S. Cl. 297—389 6 Claims

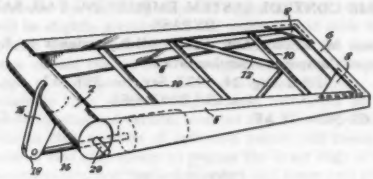


1. A seat belt assembly for protecting a vehicle occupant of a seat mounted on the floor of the vehicle body comprising:
a support mounted on one side of the seat and provided with a shaft extending longitudinally in the direction of the vehicle and the seat,
a lap strap having one end fixed around said shaft for pivotal movement of said lap strap between an occupant restraining position and a released position, said shaft being biased for holding said lap strap upright in said released position,
means engageable with the other end of said lap strap for locking the lap strap to said occupant restraining position,
an emergency locking retractor fixedly mounted on said vehicle body behind the seat, and
a shoulder strap having one end connected to said other end of said lap strap and the other end operably connected to said retractor.

3,963,274
TIP-UP FLOORS OF TRANSPORT VEHICLES

Archibald Watson Kidd, Seend Close, Seend, Melksham, Wiltshire, England

Filed Nov. 8, 1974, Ser. No. 522,218
Int. Cl.² B60P 1/16
U.S. Cl. 298—22 R 7 Claims

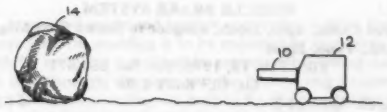


1. In a trailer, a tip-up floor assembly comprising a floor, a transverse horizontal tubular member located at the rear of said floor, said tubular member being rotatable about a longitudinal axis of rotation, normally generally horizontal arms supporting said floor, said arms being fixed at one of their ends to the tubular member to move therewith upon rotation thereof and having their upper and lower surfaces extending forwardly on respective lines spaced above and below the axis of the tubular member, a normally generally vertically oriented crank bracket, and a single acting ram coupled to said crank bracket to operate it, the upper end portion of said bracket embracing and being fixed to the tubular member and the lower end portion of the bracket being movable forwardly and backwardly by said ram, whereby the floor can be pivoted from a horizontal position to tip up the floor, with the floor being cantilevered outwardly from said tubular member, said bracket and said ram being so oriented as to impose substantially maximum torque on said tubular member during the first part of the tipping movement from horizontal and subsequent diminishing torque as said floor and arms move toward the vertical position.

3,963,275
METHOD OF BREAKING FREE-STANDING ROCK BOULDERS

Charles S. Godfrey, Berkeley, and John D. Watson, San Leandro, both of Calif., assignors to Physics International Company, San Leandro, Calif.

Continuation-in-part of Ser. No. 329,615, Feb. 5, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,730
Int. Cl.² E21C 37/00
U.S. Cl. 299—13 9 Claims



1. The method of fragmenting a free-standing boulder comprising

determining the average diameter of said boulder to determine the time required for sound to traverse said average diameter

determining the compressive strength of said boulder,

selecting a projectile having a mass which will establish an impact stress within said boulder greater than the compressive strength of the boulder, when impacted upon said boulder with a velocity which causes an energy transfer to said boulder within a time less than said determined time,

loading said cannon with said selected projectile,

loading said cannon with a charge which when detonated will cause said projectile to impact upon said boulder with said velocity, aiming said cannon at said boulder, and detonating said charge.

3,963,276

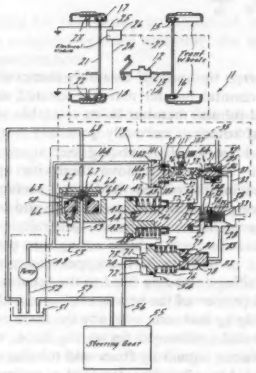
SKID CONTROL SYSTEM EMBODYING FAIL SAFE BYPASS

Thomas M. Atkins, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 24, 1973, Ser. No. 391,463

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 AF **15 Claims**



1. A skid control system for a vehicle having at least one wheel brake comprising a brake actuating circuit for delivering an actuating fluid to the one wheel brake under selective operator actuation, skid control means including a member movable from a normal braking position to a skid control position in response to a predetermined signal for relieving the pressure in the one wheel brake to prevent a skid condition, power means for normally holding said movable member in its normal braking position, and fail safe means responsive to the operation of said power means for providing an open path of actuating fluid to the one wheel brake in the event of a failure of said power means for conditioning said system for brake operation prior to generation of pressure in the brake actuating circuit.

3,963,277

VEHICLE BRAKE SYSTEM

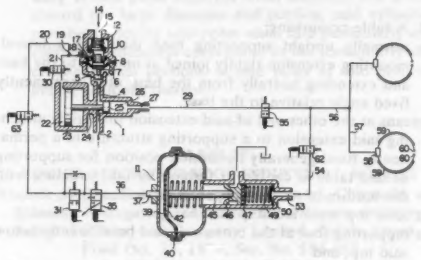
Haruo Chiba, Ageo, Japan, assignor to Sanwa Seiki Mfg. Co. Ltd., Yono, Japan

Filed Feb. 18, 1975, Ser. No. 550,671

Int. Cl.² B60T *8/04*

U.S. Cl. 303—21 F **4 Claims**

1. In a vehicle brake system of the type comprising a master cylinder, a power booster adapted to be operatively coupled to said master cylinder, said power booster having an actuating pressure inlet port through which actuating pressure is normally introduced for actuation of said power booster in response to the pressurized fluid from said master cylinder and having a brake pressure outlet port from which brake pressure is normally fed to wheel cylinders of the vehicle through a first hydraulic line in response to actuation of said power booster by said actuating pressure, and an anti-skid device in said brake system comprising an actuator hydraulically connected in parallel with said power booster for alternately applying and releasing brake pressure to and from said wheel cylinders independently of said power booster when skidding of the vehicle occurs, a second hydraulic line coupling said actuating pressure inlet port of said power booster to said actuator, a third hydraulic line coupling said actuator to said wheel cylinders, first valve means interposed in said first hydraulic line and operable to effect communication between said brake pressure outlet port of said power booster and said wheel cylinders when the brake is normally applied in the absence of



any skidding and operative to interrupt said communication when skidding occurs, second valve means interposed in said second hydraulic line and operable to interrupt communication between said actuating pressure inlet port and said actuator when the brake is normally applied in the absence of any skidding and operative to effect said communication when skidding occurs, discharge valve means interposed in said second hydraulic line between said second valve means and said actuator and operable to effect communication between said second valve means and said actuator when skidding ceases and operative to discharge the pressurized fluid from said actuator when skidding occurs, and third valve means interposed in said third hydraulic line and operable to interrupt communication between said actuator and said wheel cylinders when the brake is normally applied in the absence of any skidding and operative to effect said communication when skidding occurs.

3,963,278

TRACK ROLLER FRAME AND FINAL CASE MOUNTING

Charles M. G. Van Wuytswinkel, Thimeon, Belgium, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1975, Ser. No. 543,574

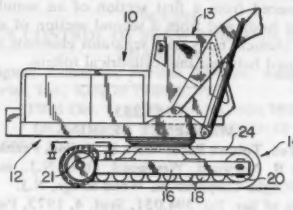
Int. Cl.² B60S *1/62*

U.S. Cl. 305—12 **5 Claims**

1. In track-type vehicle adapted for movement along a longitudinal axis thereof, which comprises a track roller frame having a pair of laterally spaced outer and inner rails, a track which moves over said frame, a sprocket, a sprocket shaft cover and a final drive having a housing, the improvement of mounting the final drive housing while protecting it and the sprocket from accumulation of dirt, comprising:

a guard member secured to a rearward end of said rails and including a sleeve extending rearwardly from the rearward end of the inner of said rails and a support secured to said sleeve and to an inner side of said inner rail, said sleeve being axially disposed about said housing to protect and reduce accumulation of dirt on said final drive housing and on said track; and

a flange extending from adjacent the periphery of one side of said sleeve inwardly radially secured between said



sprocket shaft cover and said final drive housing, said flange serving to secure said housing to said guard member.

3,963,279

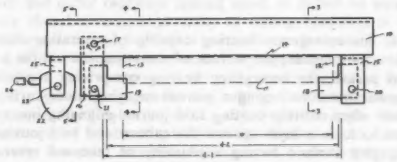
MOVABLE GUIDE BAR

Clifton Joe Eichler, Aransas Pass, Tex., assignor to Loyd W. Richardson Construction Company, Aransas Pass, Tex.

Filed Aug. 14, 1975, Ser. No. 604,537

Int. Cl.² F16C *17/00*

U.S. Cl. 308—3 R **5 Claims**



1. A movable guide for use on a table top having a flat top surface and having sides which are parallel one to the other and each of which sides overhang the means supporting said table top, the perpendicular distance between said side edges being the width of said table top, said guide comprising:

a straight, horizontally disposed rail member adapted to lie flat on a said flat top surface of said table top transversely of the parallel sides of said table top, the length of said rail member being greater than width of said table top, the horizontally disposed bottom edge of said rail member being flat so as to rest on said table top, at least one side edge of said rail member being a flat, vertical, planar guide surface such that articles engaged therewith which are passed across said table top will be guided to travel in a direction perpendicular to the sides of said table top;

said rail member having a downwardly extending, fixedly attached vertical member adjacent one end thereof and a downwardly extending, pivotally attached vertical member adjacent the opposite end thereof, the distance between such vertical members, when the pivotally attached vertical member is in a vertical position, being greater than the width of said table top;

each of said vertical members having pivotally attached thereto and located below the bottom edge of said rail member a gripping member having a notch therein for gripping the bottom edge of the adjacent overhanging side of said table top, the edges of each said notch being substantially perpendicular to each other so as to form an inside corner angle of about 90° therebetween, the length of each edge of a said notch being from about one-fourth to seven-eighths times the thickness of the overhanging portion of said table top, the two gripping members being so pivotally attached that their respective notches may be rotated to face inwardly so as to oppose each other;

each said gripping member being pivotally attached to its respective vertical member and each said vertical member being attached to said rail member such that when the notch of each said gripping member is facing inwardly toward the adjacent overhanging side of said table top with one edge of the notch therein vertically disposed and the other edge of the notch therein horizontally disposed and extending inwardly from the lower end of said vertically disposed edge toward the adjacent overhanging side of said table top, and when the pivotally attached vertical member is in a vertical position, the perpendicular distance from the said horizontally disposed edge of the notch therein to the bottom edge of said rail member will be slightly less than the thickness of the adjacent overhanging side of said table top, with the point of pivotal attachment of each said gripping member being on an imaginary line extending downwardly and outwardly of the inside corner of the notch therein, and the distance between the vertically disposed edges of the two notches will be slightly greater than the width of said table top;

rotatable cam means attached to and below the bottom edge of said rail member for engagement with the outer edge of said pivotally attached vertical member, said rotatable cam means being located outwardly of said pivotally attached vertical member and in such proximity thereto that rotation of said cam means will cause the lobe of said cam means to engage the outer edge of said pivotally attached vertical member and force said pivotally attached vertical member inwardly toward the side edge of said table top adjacent thereto a sufficient distance to cause the opposite sides of said table top to be gripped firmly by and between said gripping members.

3,963,280

PUSHROD GUIDE AND LOCATOR

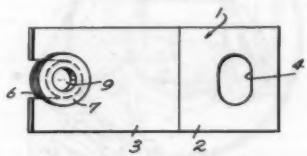
Philip Edward Irving, Warrandyte, Australia, assignor to Jeffrey Robert Hughes, Australia

Filed Feb. 5, 1975, Ser. No. 547,242

Claims priority, application Australia, Aug. 9, 1974, 65483/74

Int. Cl.² F16C *29/02*

U.S. Cl. 308—5 V **9 Claims**

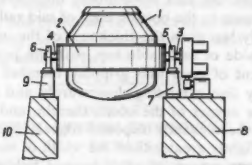


1. A pushrod guide and locator comprising a plate having mounting means enabling it to be mounted to an engine and a bush for receiving a pushrod for reciprocating sliding movement therethrough; the plate and the bush having co-operating guide means mounting the bush to the plate, restricting the bush against movement in the directions of movement of the pushrod through the bush and mounting the bush for reciprocating movement in one and an opposite direction laterally of the movement of the pushrod through the bush.

3,963,281
EXPANSION BEARING ASSEMBLY FOR A CONVERTER CARRYING TRUNNION

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 2, 1975, Ser. No. 538,203
Claims priority, application Austria, Jan. 10, 1974, 166/74
Int. Cl.² F16C *17/00*
U.S. Cl. 308—6 R **11 Claims**

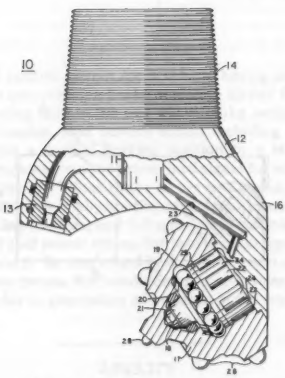


1. An expansion bearing assembly for a converter carrying trunnion, which comprises:
- a bearing housing having a top and bottom and recesses distributed over its inner surface,
- an inner race secured in place on the trunnion,
- an axially displaceable outer race having flattened faces peripherally distributed over its outer surface and lying opposite the recesses of the bearing housing, and
- rollers arranged in the recesses and interacting with the flattened faces that form contact surfaces for the rollers.

3,963,282
CANTILEVERED ROLLER SEPARATOR FOR ROCK BIT BEARINGS

Samuel Lee Penny, Lancaster, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 13, 1975, Ser. No. 549,586
Int. Cl.² F16C *19/04*
U.S. Cl. 308—8.2 **6 Claims**

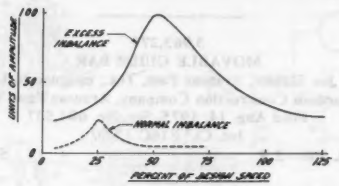


1. A rotary rock bit, comprising:
- a rock bit body;
- at least one bearing pin extending from said rock bit body, said bearing pin having a longitudinal axis;
- a cutter member rotatably positioned on said bearing pin;
- a plurality of cylindrical rollers positioned around said bearing pin between said bearing pin and said cutter member, said cylindrical rollers having a longitudinal axis with the longitudinal axis of the cylindrical rollers being substantially parallel to the longitudinal axis of said bearing pin; and,
- a split bearing cage positioned on said bearing pin, said split bearing cage comprising a plurality of separator elements cantilevered from a first section of an annular spacer element body and from a second section of an annular spacer element body, said separator elements alternately positioned between said cylindrical rollers.

3,963,283
EMERGENCY BEARING

Angelo De Feo, Totowa Boro; Mark R. Kulina, Franklin Lakes, and Earl B. Norwood, Westwood, all of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Division of Ser. No. 394,051, Sept. 4, 1973, Pat. No. 3,880,479. This application Jan. 9, 1975, Ser. No. 539,695
Int. Cl.² C22C *5/00*; F16C *17/02*, *17/20*, *32/00*
U.S. Cl. 308—78 **2 Claims**

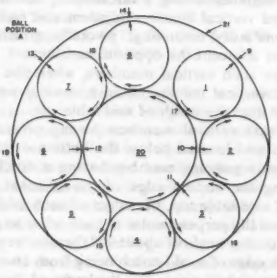


1. An emergency bearing capable of operating without lubrication against the surface of a rotating journal for a limited period, the emergency bearing comprising a generally annular member having a journal-engaging inner surface, a silver alloy entirely coating said journal-engaging inner surface to form a layer spaced thereabove and said journal — engaging surface having a plurality of recessed reservoirs therebelow filled with said silver alloy which when said emergency bearing is operating dampens any imbalance and, as a result of the coating wearing away, sufficient heat is produced to melt the silver alloy in the reservoirs whereupon said melted alloy is wiped into any space between the journal and bearing to lubricate the bearing surface during the short emergency period of operation.

3,963,284
FRICTION REDUCING BEARING

John R. Bouchard, Canton, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 14, 1973, Ser. No. 425,321
Int. Cl.² F16C *33/00*, *19/04*
U.S. Cl. 308—187 **4 Claims**



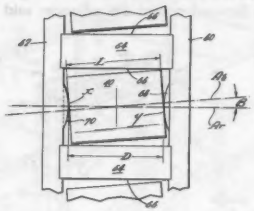
1. A method of reducing friction in a ball-bearing pivot assembly which includes balls of a given density comprising

the step of floating said balls within said assembly in a fluid lubricant of density substantially equal to that of said balls.

3,963,285
CAGE CONTROL OF SKEW ANGLE IN ROLLER BEARINGS

Erik Magnus Kellstrom, Partille, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Filed Oct. 9, 1973, Ser. No. 404,787
Int. Cl.² F16C *19/00, 13/00, 33/58*
U.S. Cl. 308—202 **5 Claims**



1. A bearing comprising inner and outer members having inner and outer raceways spaced apart to define an annular space therebetween, a plurality of rolling elements in said annular space engaging said raceways at contact zones, operation of said bearing under externally applied load having a radial and axial component normally producing forces creating a negative moment on the rolling elements tending to dispose said rolling elements at a negative skew angle relative to the axis of the bearing wherein the friction force components in the axial direction arising in said contact zones of each raceway act in the same direction as the axial component of the externally applied load on the respective raceways, a cage for circumferentially spacing said rolling elements, the improvement comprising skew control means associated with said cage operable during operation of the bearing for a predetermined relative movement of said members and said rolling elements, to cause all the rolling elements in the load zone to assume a non-negative skew angle within a predetermined angular range, said rolling elements having a finite skew angle when the axis of the rolling element and the axis of the bearing are not coplanar, said means engageable with the rolling elements at predetermined locations during operation of the bearing to develop forces between said cage and rolling elements at said predetermined locations to maintain a non-negatively skewed position of the rolling elements, said rolling elements being positively skewed when the friction force components in the axial direction arising in a contact zone between said rolling elements and raceways and acting on a raceway are so directed that they oppose the axial component of the externally applied load carried by said raceway.

3,963,286
ANTIFRICTION ROLLER BEARING

Richard B. Stanley, 4 Coventry on Duxbury, Rolling Meadows, Ill. 60008

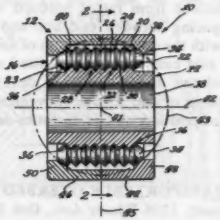
Filed Mar. 11, 1974, Ser. No. 449,699
Int. Cl.² F16C *19/00, 13/00*
U.S. Cl. 308—205 **5 Claims**

1. In a rolling bearing assembly defining a bearing axis and including an inner race, an outer race disposed about the inner race and concentric with the bearing axis, and a plurality of rolling bearings interposed between the inner and outer races, with the rolling bearings each comprising an elongate roller defining a shank intermediate the ends thereof, the improvement wherein:

the inner race is formed to define an inner raceway thereabout,

said inner raceway and said shanks of said rollers being formed to define right flanges and right grooves in interfitting relation forming the areas of rolling engagement of the rollers with the inner race raceway,

said outer race defining an outer raceway thereabout on which said rollers ride in rolling engagement therewith and having its raceway surfacing of circular contour



transversely of the bearing axis and across the area of same that is engaged by said rollers,

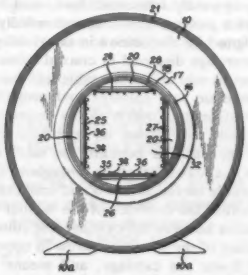
with said outer raceway surfacing area being a surface of revolution that is smoothly contoured axially of the bearing assembly,

and with the area of engagement of said rollers with said inner race at said inner raceway being at least equal to the area of engagement of said rollers with said outer race outer raceway.

3,963,287
STORAGE DEVICES

Richard Roy Rumble, 47 Orchard Court, Portman Square, London, W.1, England

Filed Jan. 16, 1975, Ser. No. 541,433
Claims priority, application United Kingdom, Jan. 19, 1974, 60244/74
Int. Cl.² A47B *81/00, 81/06*
U.S. Cl. 312—197 **2 Claims**



1. A storage device for housing tape cassettes or the like with the end portions thereof accessible for manipulation and visual inspection, comprising a housing including a pair of spaced parallel side members, a circular flange formed on at least one said side member, said flange extending toward and terminating a predetermined distance from said other side member, said side members including central circular apertures, a cylindrical inner assembly mounted between said side members for rotation about an axis normal to said side members and coincident with the axis of said circular flange, said inner assembly including a hub extending between said side members, said hub including a hollow inner periphery accessi-

ble through said apertures of said side members, a plurality of regularly spaced projections formed on said hub, said projections extending radially outwardly from said hub, at least one radially directed clearance slot formed in said flange, said slot being directed toward said other side member, the transverse distance between said other side member and said slot being greater than said predetermined distance, whereby a cassette may be inserted into and removed from the space bounded by said hub, side members and circular flange only when an appropriate series of said projections is aligned with a said slot, cassettes within said space and out of registry with said slot being blocked from radial outward movement by said flange, the spacing between said hub and said flange being coordinated with the depth dimension of said cassettes in such manner that said cassettes are permitted a range of angular movement relative to said storage device when mounted therein, the limits of said angular movement being defined by engagement of portions of said cassettes and said flange.

3,963,288

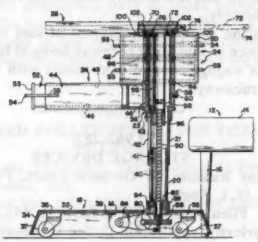
TRANSPORTABLE OVERBED TABLE

John W. Burnett, 1226 Edmer Ave., Oak Park, Ill. 60302

Division of Ser. No. 428,359, Dec. 26, 1973, Pat. No. 3,908,565. This application June 9, 1975, Ser. No. 585,349

Int. Cl.² A47F *5/08*

U.S. Cl. 312—209 **6 Claims**



1. A transportable overbed table and cabinet construction comprising a wheeled base, a tubular column secured to and projecting upwardly from said base, said base presenting a portion which projects forwardly and radially from the column and is designed for disposition in the vicinity of a bed frame, a tubular carriage disposed in coaxial telescopic relationship with respect to said column, a table unit having its proximate end mounted on said carriage and projecting radially outwardly therefrom and overlying the projecting portion of the base, a drawer unit having its proximate end hingedly connected to the carriage beneath the table unit for swinging movement in a horizontal plane throughout an angle of at least 90°, a rotatable elevation screw and cooperating traveling nut disposed within the confines of the tubular carriage and column, effective between the carriage and column, and operable upon rotation of the elevation screw in opposite directions to raise and lower the carriage, and means for rotating said elevation screw.

3,963,289

GREETING CARD DISPLAY

Lois A. Pralle, 14687 Kazan, Irvine, Calif. 92714

Filed Sept. 23, 1974, Ser. No. 508,187

Int. Cl.² A47F *3/00*

U.S. Cl. 312—245 **1 Claim**

1. A greeting card display comprising in combination:

a. a generally rectangular inclosure comprising a transparent imperforate front wall, a pair of transparent imperforate side walls, a transparent top wall, an imperforate bottom wall, and a rear wall;

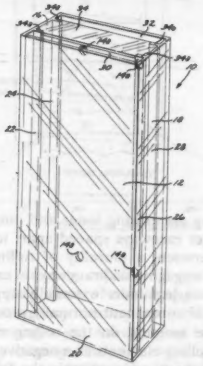
b. said front and rear walls being substantially wider than said side walls;

c. four substantially similar partitions positioned inside said inclosure and extending substantially from said top wall to said bottom wall with two of said partitions situated on each of said side walls;

d. said partitions being parallel to one another and arranged on said side walls as a forward pair and a rearward pair with one partition from each pair situated on one side wall in alignment with the other partition of that pair on the other side wall;

e. said partitions extending from said side walls substantially the same distance and substantially parallel to said front and rear walls;

f. said forward pair of partitions forming within said inclosure a forward receptacle adjacent said front wall and



said rearward pair of partitions forming a rearward receptacle adjacent said rear wall, said receptacles individually receiving separate portions of a greeting card and said receptacles being spaced from each other;

g. said forward pair of partitions being closer to said forward wall and said rearward pair of partitions being closer to said rearward wall than either pair of partitions is to each other and providing a substantial space between said forward and rearward receptacles to permit viewing a first portion of a greeting card through said front wall and a second portion of the greeting card through that portion of said side walls between said forward and rearward receptacles; and,

h. said top wall covering the substantial space between said forward and rearward receptacles leaving only said forward and rearward receptacles open at the top for insertion of the greeting card portions.

3,963,290

HANGING FITTING FOR FREIGHT RECEPTACLES, KNOWN AS CONTAINERS

Albert Rennemann, Goldbach, Germany, assignor to Johann Birkart, Internationale Spedition, Aschaffenburg, Germany

Filed Mar. 20, 1975, Ser. No. 560,317

Int. Cl.² B65D *7/46*; A47F *5/10*

U.S. Cl. 312—321 **12 Claims**

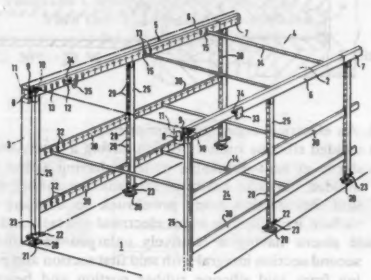
1. A detachable frame assembly capable of being removably mounted on the inside of a shipping container of relatively large capacity without requiring structural alteration of said container to adapt said container to have stored therein hanging objects such as garments, said assembly comprising:

a supporting frame formed of a plurality of longitudinal and transverse straps of an equivalent length which is a fraction of the length of said container, said straps being arranged in groups and connected with each other by

lockable plug connections to form support elements for said frame;

detachable clamping means for bracing said frame against opposite end walls of said container, said detachable clamping means including screw spindle drives for applying oppositely directed forces against said container walls to support said supporting frame within said container;

vertical supports for said straps bearing against said container walls and likewise consisting of a plurality of parts connected together by lockable plug connections and by detachable clamping means including screw spindle drives;



a plurality of suspension rods arranged in a transverse direction of said container and locked on opposite ends thereof with said supporting frame;

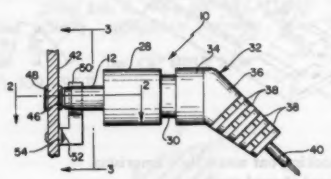
said supporting frame being arranged directly beneath the upper wall of said container with said screw spindle drives each containing a supporting plate bearing on a wall of said container, a screw spindle extending to within the support elements of said supporting frame, and a spindle nut including handles and bearing upon an end space of a support element of said supporting frame.

3,963,291

SWIVEL ELECTRICAL CONNECTOR

Robert Edward Maloof, East Greenwich, R.I., assignor to Victor Electric Wire & Cable Corporation, West Warwick, R.I.

Filed Aug. 4, 1975, Ser. No. 601,712
Int. Cl.² H01R *39/00*
U.S. Cl. 339—8 P **6 Claims**



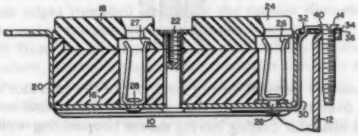
1. A swivel electrical connector comprising a tubular external conductor, a tubular internal conductor located internally of said external conductor in coaxial relation with respect thereto, an insulating material separating the conductors so that each forms part of a separate electrical circuit, a first conducting lead joined to said external conductor, a second conducting lead joined to said internal conductor, the insulating material defining a body that encapsulates the connections of said conducting leads to said conductors therein, said tubular internal conductor defining a socket for receiving a male conductor prong therein and said external conductor being exposed for engagement by a spring contact, wherein said body and conductors mounted thereon are swivally movable about the male prong as received in said internal conductor, said spring contact being maintained in continuous contact with said external conductor during the swivel movement thereof.

3,963,292

WIRING DEVICE WITH SELF-GROUNDING ELEMENT

Clarence M. Smith, deceased, late of Trumbull, Conn. (by Mary M. Smith, executrix), assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1972, Ser. No. 266,791
Int. Cl.² H01R *3/06*
U.S. Cl. 339—14 R **4 Claims**



1. A wiring device for mounting in a metal wall box and comprising: an insulating housing; a metal mounting yoke secured to said housing, said yoke having a portion extending away from said housing for mounting the device in the wall box with a fastener aperture in said portion; a grounding element of conductive metal secured to said yoke by a fastener that secures an internal contact element to said yoke, said grounding element having a contact portion normally extending at least partly across a perpendicular projection of said fastener aperture; said contact portion of said grounding element comprising an edge extending partly across said aperture projection for making edge contact with the side of a fastener in said aperture and to retain said fastener prior to installation; said yoke having a U-shaped main portion within which said housing is secured and from which said portion extending away from said housing extends, said grounding element comprising a strap disposed immediately adjacent part of said U-shaped main yoke portion, extending through an additional aperture in said extended yoke portion located nearer said housing than is said fastener aperture, extending over said extended yoke portion between said additional aperture and said fastener aperture, and terminating at an extremity having said edge, and said fastener securing said yoke, said internal contact element and said grounding element being located through the bottom of said U-shaped main yoke portion.

3,963,293

ELECTRICAL EDGE CONNECTOR

William H. McKee, West Covina, Calif., assignor to TRW Inc., Cleveland, Ohio

Filed June 28, 1971, Ser. No. 157,167
The portion of the term of this patent subsequent to June 15, 1993, has been disclaimed.
Int. Cl.² H05K *1/07*
U.S. Cl. 339—17 L **12 Claims**

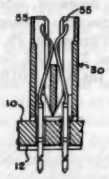
1. A printed circuit board edge connector assembly for use with a mating printed circuit board and mounted on a printed circuit board comprising;

a plurality of elongated connector elements each comprising; a base press fitted in an opening in a printed circuit board and a contact blade connected to the base said contact blade extending generally upwardly from the printed circuit board and terminating in a free end; and

an insulator casting having a chamber with a first end and a second end, said insulator removeably mounted at the first end by frictional emgagement on the contact blade with said connector element holding the insulator casting securely to the printed circuit board, and said second end receiving the free end of said contact blade and adapted

to removeably receive, edgewise, the mating printed circuit board so as to ensure electrical connection between the contact blades and the mating printed circuit board;

the insulator casting having integral means at said first end for releasably spring biasing the contact blade of each



connector element during assembly of the insulator casting over the connector elements and the second end of said insulator casting having means cooperating with the free end of said contact blade for maintaining the spring biasing of the contact blades in a preloaded position as said blade passes beyond said integral means for releasably spring biasing.

3,963,294

ELECTRICAL CURRENT SUPPLY INSTALLATIONS

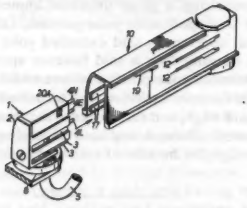
Robert Heritage, Mortlake, England, assignor to Rotaflex (Great Britain) Limited, London, England

Filed Feb. 25, 1975, Ser. No. 553,017

Claims priority, application United Kingdom, Feb. 27, 1974, 8986/74

Int. Cl.² H01R *13/60*

U.S. Cl. 339—22 R 6 Claims



1. A two part separable adapter for use in electrical current supply installations of the type including an elongated track housing supply conductors, said track including a longitudinally extending, laterally open access slot comprising a housing insertible into said track through said access slot, contact fingers movably mounted on said housing, means on said housing for shifting said contact fingers into engagement with said conductors in the inserted position of said housing in said track, a second unit adapted to be mounted in said housing and including an electrical appliance support means supported thereon, terminal means on said second unit electrically connected to said appliance, said terminal means being positioned to be electrically connected to said contact fingers of said housing responsive to movement of said unit to the mounted position thereof in said housing, complemental locking means on said housing and said second unit manually shiftable between engaging and disengaging positions, respectively locking said second unit to said housing and releasing said second unit for movement relative to said housing, said locking means, in the inserted position of said housing in said track, being disposed within said track and, hence, inaccessible to inadvertent movement to the disengaged position thereof.

3,963,295

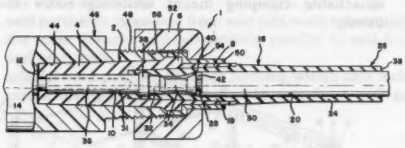
HEAT-SHRINKABLE MOLDED HIGH VOLTAGE CONNECTOR

Jan Philip Askman, Carlisle, and George Warren Wolverton, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 21, 1975, Ser. No. 570,128

Int. Cl.² H01R *13/52*

U.S. Cl. 339—60 R 3 Claims



1. An electrical connector, comprising:

a molded silicone rubber portion having a cavity therein,

a sleeve of heat-shrinkable material having a first section molded into said cavity of said silicone rubber portion, said first section being pre-shrunk to conform to the surface irregularities of an electrical contact, and

said sleeve having a relatively enlarged heat-shrinkable second section integral with said first section and protruding from said silicone rubber portion and being heat-shrinkable to conform sealably in encirclement over an insulation covered wire terminated to said contact.

3,963,296

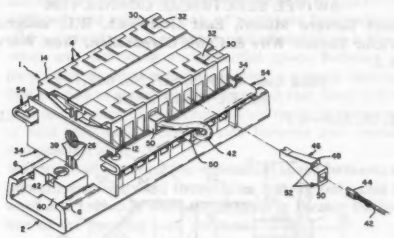
LOCKING BAR ASSEMBLY FOR HIGH VOLTAGE TERMINAL BLOCKS

Douglas Wade Glover, Harrisburg, and Mervin Amos Gardner, Highspire, both of Pa., assignors to AMP Incorporated, Harrisburg,, Pa.

Filed May 9, 1975, Ser. No. 576,069

Int. Cl.² H01R *9/16*

U.S. Cl. 339—75 M 3 Claims



1. A locking bar assembly, comprising:

a channel shaped track,

a plurality of dielectric blocks serially arranged along said track,

a plurality of electrical leads terminated with corresponding electrical contacts,

a pair of plates receiving therebetween said plurality of blocks,

said plates having mutually aligned notch portions, dielectric housings having enlarged forward portions receiving said contacts and rearward portions of reduced cross-section from which said leads protrude,

said blocks having cavities pluggably receiving corresponding forward portions of said housings therein with said rearward portions protruding from said cavities,

a locking bar having resiliently flexible opposed flanges,

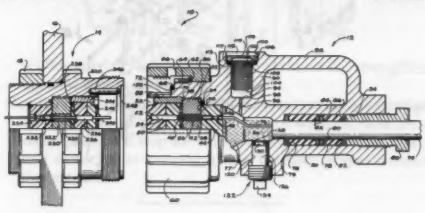
said opposed flanges being resiliently compressed toward each other and thereby latchably received in a corresponding notch portion of each said plate, and

said bar partially overlying said cavities of said blocks preventing withdrawal of said enlarged portions of said housings from said cavities.

3,963,297
UNDERWATER PRESSURE COMPENSATED ELECTRICAL CONNECTOR

George J. Panek, Phoenix, Ariz., and Gerald J. Selvin, Huntington Beach, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,344
Int. Cl.² H01R *13/52*
U.S. Cl. 339—94 M 6 Claims



1. An underwater electrical connector member comprising:

a housing containing an insulator and having a chamber therein behind said insulator adapted to hold an electrically nonconductive liquid;

at least one electrical contact mounted in said insulator;

a passage in said housing extending from said chamber to outside said housing for receiving a cable containing a conductor adapted to be connected to said contact;

first and second bores extending through the wall of said housing communicating with said chamber;

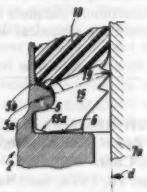
a pressure compensating bellows in said first bore having a closed end axially movable in said bore; and

an axially adjustable piston slidably mounted in said second bore for establishing a predetermined pressure on said liquid in said chamber, thereby compressing said bellows.

3,963,298
SOCKET CONNECTION OF TUBES OR TUBULAR ELEMENTS, IN PARTICULAR OF METAL

Georg Seiler, Pachmayrplatz II, Munich 81, Germany

Filed Jan. 8, 1973, Ser. No. 321,860
Claims priority, application Germany, May 29, 1972, 2226151
Int. Cl.² H01R *7/08*
U.S. Cl. 339—95 R 11 Claims

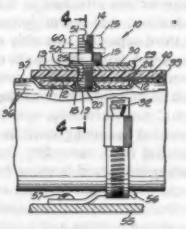


1. Socket connection for a pair of tubular elements, in particular of metal, one of which has a male end and the other of which has a female end accommodating the male end of the one tubular element with radial clearance, said female end having a terminal portion presenting a radially extending inside shoulder, including a sealing and antithrust ring with a foot section positioned within the female end of the other tubular element supported against said inside shoulder, several retaining elements distributed in circumferential direction around the foot section and having an inside edge engaging the outside diameter of the male end of the one tubular member and a head section sealing the annular space between the female end and the male end of the tubular elements, characterized in that each retaining element is firmly embedded in a radially extending groove in a foot section consisting specifically of an elastomeric material harder than that of the head section and in that each retaining element in the assembled condition of the sealing and antithrust ring is directly supported for movement about a pivot axis by the inside wall of the female end of the other tubular member so as to be pivotable and in that each retaining element presents at least two inside edges intended to engage the outside diameter of the male end of the one tubular member which are spaced differently from the pivot axis axially and radially of the tubular members, depending upon the permissible diameter tolerance of the male end of the one tubular member wherein the axial and radial spacings of the two or more inside edges from the pivot axis of the retaining element have a connecting line from the pivot axis to a respective inside edge in engagement with the male end which always has approximately the same inclination relative to the tubular elements.

3,963,299
BONDING ASSEMBLY FOR INSTALLATION ON A SHIELDED CABLE

John T. Thompson, 244 Loring St., Los Angeles, Calif. 90024, and George W. Gillemot, 2331 - 20th St., Santa Monica, Calif. 90405

Continuation of Ser. No. 295,509, Oct. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 257,692, May 30, 1972, abandoned. This application Feb. 3, 1975, Ser. No. 546,289
Int. Cl.² H01R *11/20*
U.S. Cl. 339—95 R 20 Claims



1. That improvement in a solderless bonding assembly for use in completing a high-strength high-capacity bonding connection to a shield jacket of a sheathed cable in an area concealed beneath the cable sheath, said improved bonding assembly comprising: separate inner and outer metal shoes each having a hole in the mid-portion thereof, said hole in said inner shoe being threaded, said inner shoe alone being insertable edgewise directly beneath one end of the cable shield jacket until said threaded hole is in registry with aligned holes spaced inwardly from an end edge of the superimposed portions of the cable sheath and shield jacket and which aligned holes are sized to accommodate a clamping shank for said shoes, an elongated metal shank threaded from end to end thereof and having one threaded end insertable serially first through the hole in said outer show, the aligned holes in the cable sheath and shield jacket and then into the threaded hole of said inner shoe, and retainer means on said shank receiver to hold the cable sheath and shield jacket rigidly and forcibly clamped between said inner and outer shoes to provide a high capacity bonding connection to the cable shield jacket and a high strength mechanical connection to intervening superim-

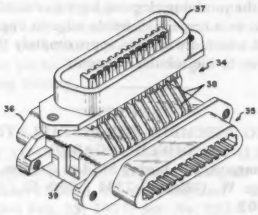
posed portions of the cable sheath and the cable shield jacket, the outer surface of said inner shoe and the inner surface of said outer shoe being complementary and being substantially parallel throughout their entire areas when assembled with said shank and the cable sheath and shield jacket in the manner set forth, the inner surface of the outer shoe being substantially continuous throughout its entire area.

3,963,300

MULTI-CONDUCTOR TAP-CONNECTOR

George Allen Patton, Pfafftown, and John James Tucci, Winston-Salem, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 11, 1974, Ser. No. 514,148
Int. Cl.² H01R 11/32
U.S. Cl. 339—156 R 9 Claims



1. A tap connector assembly for making a tap connection at a location in a multi-conductor cable, said cable having multi-contact electrical connectors attached to the ends of wires in said cable at said location, said assembly comprising:

first, second and third separate assembly connectors of the same type employed with said multi-contact electrical connectors attached to said cable ends, said assembly connectors each having similar insulating housings having a mating side and rearward side, said housings having a plurality of terminal receiving cavities arranged in first and second parallel rows extending from said rearward side to said mating side, said housing being asymetric so that said first and second cavity rows are distinct.

a plurality of terminals in said cavities, said terminals having a conductor receiving portion and a contact portion, said conductor receiving portions being identical and being aligned in first and second parallel rows along the rearward sides of said housings,

said housings being arranged in surrounding relationship to a common central axis with said rearward sides parallel to, and closely adjacent to, said common axis, said connectors being in end-to-end alignment, with said rows extending parallel to each other,

a plurality of electrical conductors extending between corresponding terminals in said first and second rows in said first and second connector housings, and a number of conductors extending from said first row in said first housing to said first row in said third housing, and a number of different conductors extending between said second row in said second housing to said second row in said

third housing, whereby

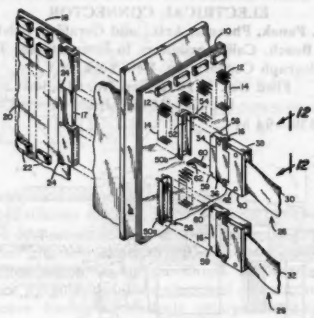
said interconnecting conductors join said connector housings in a latticework pattern rather than a chain and a compact tap connector assembly capable of being attached to multi-conductor cables having similar individual mating connectors mounted thereon is formed.

3,963,301

MOTHER-BOARD INTERCONNECTION SYSTEM

William H. Stark, West St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 535,074
Int. Cl.² H01R 13/64
U.S. Cl. 339—186 M 4 Claims



1. In a mother-board interconnection system in which a keyed electrical connector assembly having a polarizing key assembled in a first one of two polarizing key notches formed in its two opposite short ends is electrically coupled to a pattern of electrical contacts projecting from said mother-board, an insulative keyed connector guide stand-off that generally conforms to, receives and positions said keyed electrical connector assembly a predetermined distance away from said mother-board permitting electrical wiring to pass therebetween, said insulative keyed connector guide stand-off comprising:

a rectangular base member having two opposite long edges and two opposite short edges and a plurality of apertures therethrough, which apertures are arranged in a pattern that conforms to and mates with said pattern of electrical contacts in said mother-board;

two side walls projecting upwardly from said base member and oriented along said two opposite long edges;

a key post projecting upwardly from said base member and oriented along only a second one of said two opposite short edges, said key post generally conforming to a polarizing key notch in said keyed electrical connector assembly, said two side walls and said key post combining to form an open end along the first one of said two opposite short ends and to accept and mate with only said keyed electrical connector assembly;

a pluraity of legs projecting downwardly from said base member for positioning said keyed electrical connected assembly a predetermined distance away from said mother-board and permitting electrical wiring to pass therebetween.

3,963,302

ELECTRICAL CRIMP REMOVABLE SOCKET CONTACT

Charles A. Gourley, Bethel, Conn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 18, 1974, Ser. No. 451,738
Int. Cl.² H01R 11/22, 13/42
U.S. Cl. 339—217 S 3 Claims

3. An electrical contact for joining two electrically conductive elements, comprising:

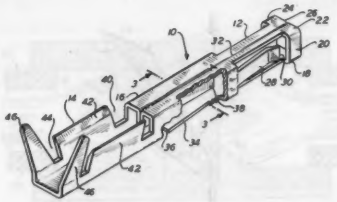
a box-like end section for receiving a first conductive element formed from a metal sheet with four side walls, one wall having a longitudinal slot formed by abutting foreshortened ends;

an open barrel crimp section for receiving a second conductive element;

a central box section formed by the extension of said four walls of said box-like end section for joining said box-like section and said open barrel crimp section;

support means formed by the continuations of said foreshortened abutting ends extended into said central box section having contiguous facing surfaces for strengthening said contact; and

stop means formed by inner and outer edges of said contiguous surfaces of said support means wherein said inner edges provide a stop for said first conductive element and said outer edges provide a stop for said second conductive element.



3,963,303

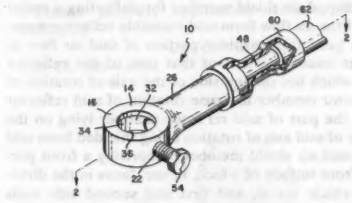
BATTERY TERMINAL CONNECTOR

Kenneth Scott Hays, Exton, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 15, 1974, Ser. No. 514,346

Int. Cl.² H01R *11/26*

U.S. Cl. 339—237 **2 Claims**



1. A corrosion resistant, light weight battery terminal connector comprising, a collar, said collar including an annular side wall; an aperture, said aperture being disposed in said annular side wall; an elongated hollow member, said hollow member being supported on said collar with the opening in said hollow member being in communication with the aperture in said annular sidewall; said collar and said elongated hollow member being comprised of rigid, electrically nonconductive material; a liner, said liner being comprised of electrically conductive material, one portion of said liner being disposed along the inner surface of said annular wall, a recess in the inner surface of said annular wall, said one portion of said liner normally being disposed in said recess, another portion of said liner extending through said hollow member; means on said other portion of said liner for engaging and enabling an electrical circuit with a battery cable; means for urging said one portion of said liner against a battery post disposed in said collar to enable an electric circuit with the post, said last name means comprising a second aperture in said annular wall, said second aperture including threads, an elongated member with complimentary threads, said elongated member being receivable within said second aperture, said one portion of said liner overlying said second aperture, and means for advancing said elongated member through said second aperture and into engagement with said liner so that it is urged against the battery post.

3,963,304

ARC-SPLITTING FIN TYPE SCREW SET

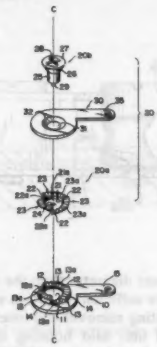
Eiji Suzuki, 22-11, Kamiyamacho, Shibuya, Tokyo, Japan

Filed Feb. 20, 1975, Ser. No. 551,574

Claims priority, application Japan, Mar. 9, 1974, 49-26776

Int. Cl.² H01R *7/06*

U.S. Cl. 339—245 **12 Claims**



1. A threaded coupling comprising a first disc element having a plurality of equi-spaced radial slits dividing said first disc element into a plurality of circumferential segments each extending in a radial direction and having in the circumferential direction progressively increasing axial height, said radial slits in said first disc element forming junctures between adjacent ones of said segments such that the adjacent edges of the segments are spaced at different elevations, said first disc element thus presenting a first thread, a second disc element provided with radial slits equal in number to those of said first disc element dividing said second disc element into a plurality of circumferential segments, each of said segments of said second disc extending in a radial direction opposite to that of the first disc, the slits of said second disc forming junctures between adjacent segments such that the adjacent edges of the segments thereof are spaced at different elevations, each of the segments of said second disc element having in the circumferential direction a progressively increasing axial height thus presenting a second thread adapted to intermesh with said first thread, a mounting block element positioned in juxtaposed relation to one of said disc elements, said mounting block having a central opening therein, a rotatable stud element having a columnar portion dimensioned to extend through the central opening in said mounting block element in engagement with said one disc element and, means for keying said stud to said one disc to conjointly rotate the same relative to the other disc, whereby the rotation of said one disc causes said thread elements to intermesh and secure said mounting block between said stud and said disc elements.

3,963,305

TERMINAL BLOCK CONSTRUCTION

Benjamin Doktor, deceased, late of Englewood, N.J., by Henrietta Doktor, administratrix, 372 Thornton Road, Englewood, N.J. 07631

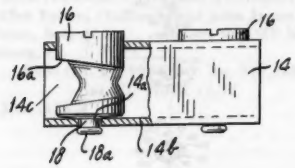
Filed Nov. 22, 1974, Ser. No. 526,269

Int. Cl.² H01R *7/06*

U.S. Cl. 339—274 **4 Claims**

1. A terminal connector for an electrical conductor comprising a housing element having walls thereof which define a chamber therein, a wedging member mounted for pivotal movement within said housing element, said housing element and said wedging member having conductor contacting surfaces within said chamber which firmly engage an electrical conductor therebetween in a predetermined pivotal position

of said wedging member, said housing element including a support plate with a hole therein, said wedging member including a supporting shaft extending away from the conductor contacting surface of said wedging member and through said hole in said support plate to provide for said pivotal movement of said wedging member, said supporting shaft including an enlarged portion at an end thereof remote from said conductor contacting surface and extending outside said chamber



and of slightly greater diameter than the diameter of said hole in said support plate sufficient to retain said wedging member in place but permitting removal and insertion of said wedging member from and into said housing element by snap-out, snap-in action in a direction along the axis of said supporting shaft, said enlarged end portion not interfering with the conductor contacting function of the wedging member by virtue of its location outside said chamber.

3,963,306

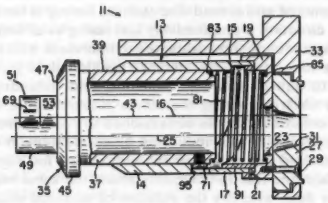
MULTIPLE OBJECTIVE SUPPORTING AND POSITIONING ASSEMBLY FOR A MICROSCOPE

Guy E. Martin, Brighton, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 375,579, July 2, 1973, abandoned. This application Jan. 22, 1975, Ser. No. 542,889

Int. Cl.² G02B 7/16

U.S. Cl. 350—39 **12 Claims**



1. A multiple objective supporting and positioning assembly for a microscope, said assembly comprising:

a. a support means having an axis;

b. carrier means including a plurality of objective mounting means; and

c. means provided on both said support means and said carrier means for permitting rotational movement of said carrier means relative to and without movement of said support means about said support means axis and simultaneous movement of said carrier means relative to and without movement of said support means in a direction parallel to said support means axis, said means including a continuous, unending cam surface fixed to one of said support means and said carrier means and a cam follower fixed to the other of said support means and said carrier means.

3,963,307

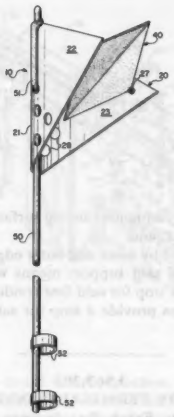
SAFETY REFLECTOR DEVICE

Norbert A. Kirk, 43 E. Ohio St., Chicago, Ill. 60611

Filed June 10, 1974, Ser. No. 478,099

Int. Cl.² G02B 5/12; B60R 1/00

U.S. Cl. 350—99 **13 Claims**



1. A safety signal device for a vehicle comprising:

a rotatable reflector member adapted to be rotated on on axis of rotation by air flow in a direction parallel to the motion of the vehicle,

a channel-shaped air shield member for deflecting a major portion of the air flow from said rotatable reflector member while permitting a minor portion of said air flow to contact at least a portion of that part of the reflector member which lies on one side of the axis of rotation of said reflector member to cause rotation of said reflector member, the part of said reflector member lying on the other side of said axis of rotation being shielded from said air flow, said air shield member comprising a front portion the front surface of which, in use, faces in the direction of vehicle travel, and first and second side walls which are interconnected by said front portion and extend rearwardly thereof to form a channel therebetween,

means affixed to the inner surfaces of said side walls for rotatably mounting said reflector in said channel, between said side walls, such that the axis of rotation of said reflector member extends between said side walls and said side walls deflect the major portion of the air which moves past said shield member in the direction of movement of the vehicle, and

vehicle mounting means for mounting said air shield member on the vehicle.

3,963,308

FOCUSING COUPLING DEVICE FOR MULTI OPTICAL-FIBER CABLE

Robert L. Lebduska, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1973, Ser. No. 373,583

Int. Cl.² G02B 5/16

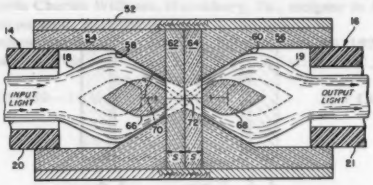
U.S. Cl. 350—96 C **2 Claims**

1. A coupling device for a fiber optic cable containing a plurality of bared free fiber ends comprising:

a connector body having a longitudinal internal bore extending therethrough providing an opening at both ends to receive said cable;

a tapered mandrel positioned within the bore approximately at the longitudinal axis of the cable and centrally to the fibers;

said internal bore being funnel-shaped for bending the free ends of said fibers and to coact with the mandrel as they are freely inserted within said body at predetermined acute angular relation to the longitudinal axis of the



connector body so that the longitudinal centerlines of a substantial number of the fibers when projected will intersect approximately at a common focal point beyond the faces of the fibers' ends and spaced therefrom to enable the light beam patterns emitting from the fiber ends to be substantially superimposed on each other at a transverse plane passing through said common focal point.

3,963,309

REFLEX LIGHT REFLECTOR SHEET AND METHOD FOR ITS MANUFACTURE

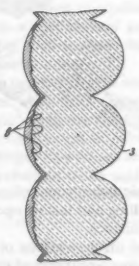
Kurt Schwab, Innsbruck, Austria, assignor to D. Swarovski & Co., Glasschleiferei, Wattens, Austria

Filed Dec. 13, 1973, Ser. No. 424,601

Claims priority, application Austria, Dec. 15, 1972, 10745/72

Int. Cl.² G02B 5/12

U.S. Cl. 350—104 **10 Claims**



1. In a reflex light reflector sheet having a front face and a rear face, wherein both said front face and said rear face are provided with a plurality of juxtaposed convex lens surfaces, said rear face being covered by a mirror surface, the improvement which comprises that:

a. the lens surface of said front face are aspherical, said surface being defined geometrically by the rotation of a meridian section deviating from a circle about an axis;

b. the lens surfaces of the rear face are Fresnel lens surfaces,

c. the respective axes of the lens surfaces on said front and rear faces coincide, and

d. the focal point of the lens which is defined by each lens surface on said front face for axially incident light is located in or in the proximity of the associated lens surface on the rear face.

3,963,310

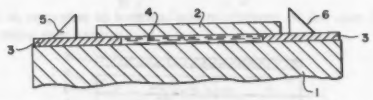
LIQUID CRYSTAL WAVEGUIDE

Thomas G. Giallorenzi, Alexandria, and Joel M. Schnur, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1973, Ser. No. 389,776

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **7 Claims**



1. A liquid crystal optical waveguide, which comprises

a transparent substrate,

a transparent plate spaced from said substrate parallel therewith,

a liquid crystal waveguide medium placed between said transparent substrate and said transparent plate in surface contact therewith and having an index of refraction greater than that of said substrate and said plate,

means to apply an electric field to said liquid crystal to cause dynamic scattering,

means to couple light into said liquid crystal waveguide medium so that the light is guided through the liquid crystal medium between said substrate and said transparent plate in a direction paralleling said substrate and said plate, and

means to couple light out of said liquid crystal medium.

3,963,311

LIQUID CRYSTAL ESTERS

Arthur Boller, Binningen, and Hanspeter Scherrer, Therwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

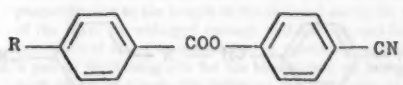
Division of Ser. No. 334,291, Feb. 21, 1973, Pat. No. 3,923,857. This application Aug. 20, 1975, Ser. No. 606,157

Claims priority, application Switzerland, Feb. 23, 1972, 2586/72; Jan. 23, 1973, 920/73

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **1 Claim**

1. An optical cell comprising liquid crystal means comprising one or more compounds selected from the group consisting of compounds of formula



wherein R is straight-chain lower alkyl of 4 to 8 carbon atoms or straight-chain lower alkoxy of 5 to 8 carbon atoms, disposed between two plate means at least one of which plate means is transparent; means for controlling the optical activity of the cell; and said liquid crystal means having a helical structure in the direction perpendicular to the plate means and the surfaces of the plate means being wall oriented.

3,963,312

CONTROLLABLE LIQUID-CRYSTAL DISPLAY DEVICE

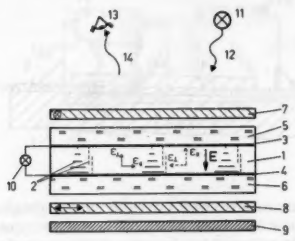
Peter Wild, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sept. 11, 1974, Ser. No. 505,139

Claims priority, application Switzerland, Sept. 27, 1973, 13837/73

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC 9 Claims



1. A controllable liquid-crystal display device comprising:
first and second transparent support plates,
a transparent electrode on a plane surface of each of said transparent support plates,
a liquid crystal contained between said first and second transparent support plates and said transparent electrodes,
first and second approximately neutral polarizers, positioned on opposite sides of said liquid crystal, said polarizers being of such a type that said first polarizer in conjunction with another polarizer of the same type exhibits a high extinction ratio and said second polarizer in conjunction with another polarizer of the same type exhibits a relatively low extinction ratio; and
a reflector of low light scattering characteristics adjacent said second polarizer.

3,963,313

LIQUID CRYSTAL SCHIFFS BASES

Boller Arthur, Binningen, and Hanspeter Scherrer, Therwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

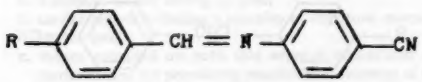
Division of Ser. No. 334,292, Feb. 21, 1973, Pat. No. 3,927,064. This application Sept. 9, 1975, Ser. No. 611,735

Claims priority, application Switzerland, Feb. 23, 1972, 2585/72; Jan. 11, 1973, 355/73

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC 1 Claim

1. An optical cell comprising liquid crystal means comprising one or more compounds selected from the group consisting of compounds of the formula



wherein R is ethyl, n-propyl, n-butyl, n-pentyl, n-hexyl, isohexyl, n-heptyl or n-octyl,
disposed between two plate means at least one of which plate means is transparent; means for controlling the optical activity of the cell; and said liquid crystal means having a helical structure in the direction perpendicular to the plate means and the surfaces of the plate means being wall oriented.

3,963,314

COLOR DISPLAY DEVICE

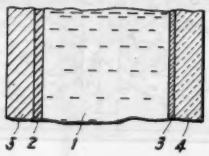
Akio Yamashita, Kawanishi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sept. 18, 1974, Ser. No. 507,204

Claims priority, application Japan, Sept. 29, 1973, 48-109996

Int. Cl.² G02F 1/36

U.S. Cl. 350—160 R 10 Claims



1. A color display device comprising a pair of electrodes, at least one of which is transparent, a dielectric layer provided on the inner face of at least one of those electrodes, and a solution containing at least one electrochromic dye and filled in a space between said electrodes in contact with said dielectric layer.

3,963,315

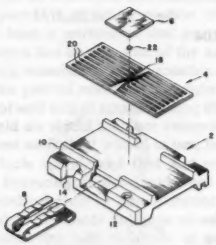
SEMICONDUCTOR CHIP CARRIER AND TESTING FIXTURE

Scott A. Bonis, Sunnyvale, Calif., assignor to Lockhead Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Apr. 7, 1975, Ser. No. 565,637

Int. Cl.² H05K 1/12

U.S. Cl. 339—17 CF 5 Claims



1. A carrier for a microelectronic-circuit chip having beam leads to facilitate handling and testing operations, comprising:
a base including a surface,
a substrate mounted on the surface of said base,
said substrate including a plurality of electrically conductive paths,
said substrate further including a rectangular aperture through said substrate,
each of said electrically conductive paths having an end adjacent said rectangular aperture,
a microelectronic-circuit chip,
said microelectronic-circuit chip further defined as being substantially rectangular in shape and having tapered sides,
said microelectronic-circuit chip including a plurality of beam leads protruding from said circuit chip,
said circuit chip aligned with said substrate entirely by cooperation of said tapered sides and said rectangular aperture,
a cover retaining the circuit chip in said rectangular aperture,

and resilient clip means for releasably holding said cover to said base, and,

wherein said clip means includes a corregated leg and a J-shaped leg.

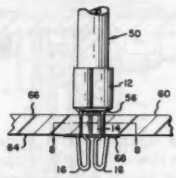
3,963,316
ELECTRICAL CONNECTOR FOR A PRINTED CIRCUIT BOARD

Benjamin Charles Williams, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 298,995, Oct. 19, 1972, abandoned. This application Nov. 1, 1973, Ser. No. 411,936

Int. Cl.² H05K *1/02*

U.S. Cl. 339—17 C **7 Claims**



1. In combination, a wire, a substrate having first and second surfaces connected by an opening therethrough and a metal contact for securing said wire to said opening and comprising:

a ferrule portion crimpable around said wire;

a crimped second portion constructed to securely hold a portion of said wire therein and further inserted within said substrate opening in a direction extending from a first surface of said substrate to the second surface of said substrate;

a channel-shaped portion having a concave portion and attached to said second portion and extending beyond said second surface of said substrate and constructed to retain the end of said wire in the concave portion thereof;

said channel-shaped portion comprising resilient finger-like means formed as a part thereof and having at least one free end extending back towards the said crimped second portion of said metal contact;

said ferrule portion constructed to contact said first surface of said substrate when said crimped second portion is inserted into said substrate opening and said channel-shaped portion constructed to have the said at least one free end of said finger-like means abut against said second surface of said substrate when said crimped second portion is inserted into said substrate opening.

3,963,317
ZERO FORCE EDGE CONNECTOR BLOCK

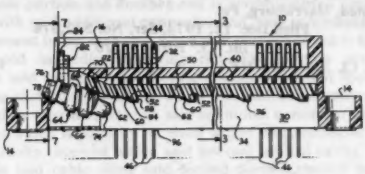
George Thomas Eigenbrode, Mechanicsburg, and Robert Franklin Evans, New Cumberland, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1975, Ser. No. 564,795

Int. Cl.² H01R *13/62*

U.S. Cl. 339—74 R **20 Claims**

1. A zero force connector block including a support, a row of terminals extending from said support and including contacts, an elongate cam bar extending along said row of terminals, said bar including surface means engageable with said terminals upon diagonal movement of the bar along its length and away from the support to flex the terminals and move the contacts between contact positions where the contacts engage pads on a circuit board or like member located adjacent the block and retracted positions away from the contact positions, a drive mechanism for longitudinally shifting said cam bar, and connection means between said cam bar and support for moving the cam bar away from the support in response to longitudinal movement of the cam bar by the drive mechanism.



3,963,318
CONTACT AND CONTACT ASSEMBLY

Council A. Tucker, Los Angeles, Calif., assignor to American Telecommunications, El Monte, Calif.

Continuation of Ser. No. 443,496, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 312,609, Dec. 6, 1972, Pat. No. 3,842,395. This application Oct. 28, 1975, Ser. No. 626,130

Int. Cl.² H01R *9/08*

U.S. Cl. 339—97 P **9 Claims**

1. An improved contact structure comprising:

a. a generally planar, vertical base;

b. a pair of upstanding, vertical blades extending from the base and in the same plane therewith;

c. the blades defining between them a mouth proximate the top of the blades, an enlarged passage below the mouth and opening into the mouth, and a coining slot below the enlarged passage and opening into the passage, the mouth having a width to compressively engage and hold a lead without damage to a conductor thereof, the enlarged passage having a pair of straight edges which converge towards and terminate at the coining slot, the converging edges being sized to strip insulation contacted by the edges from a lead, the coining slot having generally parallel and spaced apart edges and being sized to coin a conductor of a lead to effect therewith good electrical contact and a mechanical interference lock in a direction perpendicular to the length of the slot and along the axis of the lead, the enlarged passage and coining slot being symmetrical about a vertical line of symmetry; and

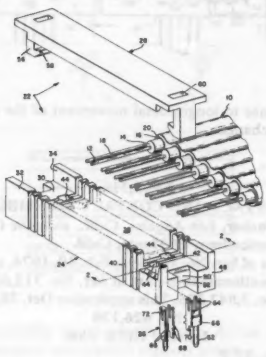
d. a pair of thickening ribs for the blades, one rib being on each blade, and both ribs being on the same side of the blades, the external lateral limit of each of the ribs being defined by a face, the thickness of the contact from the face of each rib to the surface of the contact on the side thereof opposite the ribs being substantially the width of the throat of a standard lead installation tool, the ribs being spaced on either side of the mouth, passage and coining slot, and the ribs extending vertically and directly to the sides of the coining slot at least adjacent the meeting of the enlarged passage and the coining slot.

3,963,319

COAXIAL RIBBON CABLE TERMINATOR

William Ludlow Schumacher, Camp Hill, and Robert Volinskie, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 12, 1974, Ser. No. 532,076
Int. Cl.² H01R 11/20
U.S. Cl. 339—176 MF 1 Claim



1. A device for terminating cable of the type having a plurality of parallel wires, which comprises:

a. a housing consisting of front and rear upright walls bracketing a base member, and a plurality of spaced, parallel grooves extending through the walls and across the upper surface of the base member, further the base member having a plurality of spaced openings extending vertically therethrough with each opening intersecting a groove; and b. a plurality of contact terminals adapted to be positioned in the spaced openings, each terminal having at its lower end a pin adapted to depend from the base for insertion into a printed circuit board or the like, and at its upper end a pair of spaced slotted contact members adapted to extend above the upper surface of the base member and to receive and terminate a wire which may be lying in the groove intersected by the opening, and intermediate the two ends a pair of spaced parallel walls joined on one side by a strip of material integral to the walls and having on each of the two free sides a pair of laterally projecting lances, one over the other, said lances adapted to interfere with the walls of the opening to secure the terminal when such is positioned therein.

3,963,320

CABLE CONNECTOR FOR SOLID-INSULATION COAXIAL CABLES

Georg Spinner, ErzgieBereistr. 33, 8 Munich 2, Germany

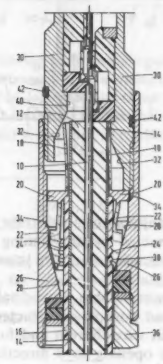
Filed June 12, 1974, Ser. No. 478,595
Claims priority, application Germany, June 20, 1973, 2331610
Int. Cl.² H01R 17/04
U.S. Cl. 339—177 R 10 Claims

1. A cable plug connector for an insulated coaxial cable: the cable comprises an internal conductor, a dielectric layer outside the internal conductor and supporting an external conductor, a thin metallic external conductor positioned around and supported on the dielectric layer, and an external protective casing of insulating material around the external conductor; an annular section of the cable casing is removed to faciliate electrical and mechanical contact with the exposed contact section of the external conductor;

said connector comprising:

a resilient spring electric contact ring extending around the contact section of the external conductor; said contact ring having a supported edge portion extending toward a clamping sleeve and having an opposite free edge portion opposite its said supported edge portion; said contact ring being so shaped and oriented that its said free edge portion is normally raised above the contact section of the external conductor and its said free edge portion is radially deflectable inwardly against the contact section of the external conductor;

a contact sleeve having an opening therein into which the cable and said contact ring are movable and which said contact sleeve opening is defined by a contact sleeve opening wall; said contact ring being movable into said



contact sleeve opening, said contact sleeve opening wall being shaped to engage and cause said contact ring free edge portion to deflect radially inwardly as said contact sleeve is moved toward the clamping sleeve and moved toward and into engagement with a gripping sleeve and this causes said contact ring free edge portion to engage the contact section of the external conductor;

a gripping sleeve over the cable extending toward and meeting with said contact sleeve and also extending over said connector; said gripping sleeve being shiftable on and toward said contact sleeve such that said gripping sleeve and said contact sleeve engage and move together a predetermined distance once they engage; a gripping sleeve opening formed in said gripping sleeve for receiving the cable and for receiving a clamping sleeve and having a gripping sleeve opening wall defining said gripping sleeve opening; said gripping sleeve opening facing toward said contact sleeve opening;

a resilient clamping sleeve having a supported edge portion which is connected with and supported together with said supported edge portion of said contact ring; said clamping sleeve extending away from said contact ring and extending around the cable casing; said clamping sleeve being shaped and oriented to extend into and being movable into said gripping sleeve opening; said clamping sleeve being slit into a plurality of tongues all extending into said gripping sleeve opening; said clamping sleeve tongues having a free edge portion, opposite said clamping sleeve supported edge portion, and said free edge portion is normally raised above the cable and is radially deflectable inwardly against the cable casing; said gripping sleeve opening wall being shaped to engage and cause said clamping sleeve free edge portion to deflect radially inwardly as said gripping sleeve is moved toward and on said contact sleeve and to cause said clamping

sleeve to thereby engage the cable casing.

3,963,321

CONNECTOR ARRANGEMENT FOR COAXIAL CABLES

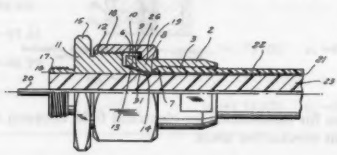
Walter Burger, Bechen, and Hans Leo Ditscheid, Refrath, both of Germany, assignors to Felten & Guilleaume Kabelwerke AG, Cologne, Germany

Filed Aug. 21, 1974, Ser. No. 499,427

Claims priority, application Germany, Aug. 25, 1973, 2343030

Int. Cl.² H01R 17/04

U.S. Cl. 339—177 E 10 Claims



1. In a combination, a coaxial cable having a protective outer sheath, an outer conductor inwards of said outer sheath and an inner conductor inwards of said outer conductor, the coaxial cable having an end comprised of an endmost first portion along which said inner conductor is exposed, a second portion from which both said protective sheath and said outer conductor have been removed, a third portion from which said protective sheath has been removed, and a fourth portion from which said protective sheath has not been removed; a moisture-proof and radiation-impervious connector arrangement connected to said end of said coaxial cable and comprising a connector sleeve having one end surrounding and tightly holding said fourth portion of said cable and provided at its other end with an internal conical cavity surrounding said third portion of said cable, an additional one-piece connector unit including an axially extending portion surrounding said second portion of said cable and having a conically configurated end portion which is located slipped under said outer conductor along at least part of said third portion of said cable, said conically configurated end portion projecting into said conical cavity in said connector sleeve, and said outer conductor along at least said part of said third portion of said cable being outwardly deformed and widened and tightly wedged between the outer surface of said conically configured end portion and the wall of said internal conical cavity all around the circumference of the wedged portion of said outer conductor, said conically configurated end portion, said wall of said internal conical cavity and the wedged portion of said outer conductor together forming a circumferentially complete annular seal, and wherein the material of said additional connector unit at the portion thereof in contact with said wedged part of said outer conductor is electrically conductive so that all around said circumferentially complete annular seal there exists a circumferentially complete annular zone of electrical contact between the wedged portion of said outer conductor and said conically configurated end portion; and means connecting together said connector sleeve and said additional connector unit, wherein said connector sleeve is comprised of a collar portion which constitutes said one end of said connector sleeve and which surrounds and tightly holds said protective outer sheath and an internal shoulder separating the interior of said collar portion from said internal conical cavity, said collar portion being provided on the interior wall thereof with a large-pitch screwthread screwed into the material of said protective sheath of said fourth portion of said cable end, and wherein the end face of said protective sheath at the boundary of said fourth portion of said cable abuts against said shoulder to be thereby properly positioned within said connector sleeve, wherein said connector sleeve at the end thereof provided with said internal conical cavity is further provided with an annular outwardly projecting abutment portion, and wherein said means comprises a connector nut having one end provided with an inwardly projecting ridge-like portion which abuts against said outwardly projecting abutment portion and another end in screwthreaded engagement with said additional connector unit, said screwthreaded engagement being such that when said connector nut is tightened said inwardly projecting ridge-like portion presses against said outwardly projecting abutment portion thereby drawing said connector sleeve and said additional connector unit tightly together, wherein said additional connector unit is an inset which is partially received within said connector nut and partially received within said internal conical cavity, and wherein said cable along said second portion thereof has a predetermined outer diameter, and wherein said inset has an internal bore having a diameter substantially equal to said predetermined outer diameter so as to surround and firmly hold said second portion of said cable end, and wherein said inset at the end thereof facing away from said internal conical cavity is further comprised of an extension provided with an external screwthread for connecting said inset to another component.

3,963,322

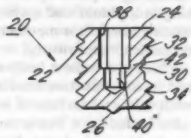
TORQUE CONTROLLING SET SCREW FOR USE WITH THE CABLE OF SOLDERLESS CONNECTORS, OR THE LIKE

Carl E. Gryctko, Haddon Heights, N.J., assignor to ITE Imperial Corporation, Spring House, Pa.

Filed Jan. 23, 1975, Ser. No. 543,317

Int. Cl.² H01R 11/10

U.S. Cl. 339—272 R 4 Claims



1. An integral, unitary set screw adapted for being tightened up to a predetermined maximum torque, comprising:

a helically threaded screw shaft adapted to be tightened in a matingly threaded tapped opening; a head at one end of said shaft; a tip, for engaging an object, at the opposite end of said shaft;

a head portion extending from said head toward and part of the distance to said tip; a tip portion extending from said tip toward said head portion; said tip portion having a top side on the side thereof opposite said tip, and said tip portion top side faces toward said head portion;

a first tightening wrench receiving bore profiled to receive and engage a wrench and also extending from said tip portion top side partially through said tip portion toward said tip;

a second tightening wrench receiving bore profiled to receive and engage a wrench and also extending from said head completely through said head portion to said tip portion top side and meeting, being coaxial with and forming a continuous bore with said first bore; said second bore being of larger cross-section than said first bore thereby enabling said second bore to receive a larger cross-section tightening tool than is receivable by said first bore;

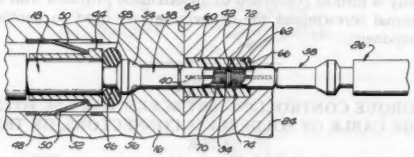
a junction along said shaft and located at the junction between said tip portion top side and said head portion; said first and second bores meeting at said junction; at said junction, between the exterior of said shaft and both of said first and second bores, the material of said shaft has a rduced cross-sectional area, as compared with the

cross-sectional area of the remainder of said shaft, which said reduced cross-sectional area serves to weaken said shaft to an extent that said shaft breaks at said junction to separate said head and said tip upon a tightening wrench fitted in said second bore applying more than said predetermined maximum torque.

3,963,323
FIBER OPTIC CONNECTOR WITH PROTECTIVE CABLE SLEEVES

Bruce K. Arnold, El Toro, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,024
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C **7 Claims**



1. A fiber optic connector for joining the ends of a pair of fiber optic bundles comprising:

first and second fiber optic cables each containing a fiber optic bundle including a plurality of light transmitting fibers terminating in a planar end surface;

first and second mating connector members containing said first and second cables, respectively;

each said cable including a hollow body substantially surrounding the end of its respective bundle and having one end coplanar with said end surface of said bundle;

each said cable also including a sleeve surrounding its respective hollow body, said sleeve having at one end thereof a flat annular flange extending inwardly over said end of said body providing an optical window for said bundle, said flat annular flange lying in a plane parallel to said planar end surface; and

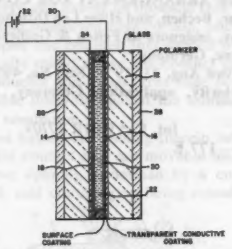
means in said connector members positioning said cables in axial alignment and causing said flanges at the ends of said cables to abut each other when said connector members are mated whereby said planar end surfaces of said bundles are axially spaced apart.

3,963,324
LIQUID CRYSTAL DISPLAY ASSEMBLY

James L. Fergason, Kent, and Duane E. Werth, Stow, both of Ohio, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 250,890, May 8, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,571
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **3 Claims**

1. In a liquid crystal display, the combination of a pair of transparent parallel plates, areas of transparent conductive material on the facing surfaces of said transparent parallel plates, a layer of a water soluble organic polymer selected from the group consisting of polyvinyl alcohol, polyethylene oxide, and polyvinyl pyrrolidone deposited over said transparent conductive material which will facilitate the production of well-defined lines produced upon rubbing, the transparent conductive areas with said material thereon being rubbed unidirectionally, a layer of liquid crystal material between said transparent conductive areas whereby a twisted nematic structure will be produced in the liquid crystal material by virtue of said unidirectional rubbing, polarizers on the sides of said transparent plates opposite said liquid crystal material, and

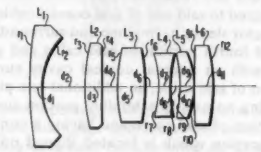


means for establishing an electrical field between said transparent conductive areas.

3,963,325
WIDE ANGLE LENS

Yasuo Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 570,150
Claims priority, application Japan, Apr. 24, 1974, 49-46104
Int. Cl.² G02B 9/62
U.S. Cl. 350—215 **1 Claim**



1. A wide angle lens system comprising six lens components constituted by six lens elements wherein the first lens is a negaive meniscus lens convex to the object, the second lens is a positive lens, the third lens is a positive lens, the fourth lens is a biconcave negative lens, the fifth lens is a positive meniscus lens convex to the image and the sixth lens is a positive lens, wherein the following conditions are satisfied:

1. $F/1.2 < F_1 < F/0.8 \cdot F_1 < 0$
2. $F/1.8 < F_{1.2.3} < F/1.4$
3. $0.2F < d_2 < 0.45F$
4. $0.7F < (d_1 + d_2 + d_3 + d_4 + d_5 + d_6) < 0.9F$
5. $0.2 < (n_2 + n_3/2) - n_1 < 0.32$

wherein the reference characters designate the following dimensions:

F: effective focal length of the whole system

$F_{1.2....i}$: effective focal length of the lens system comprising the first to the i-th lenses

r_j: radii of curvature of the j-th face

d_k: axial air separations of thicknesses of the k-th air separation or lens thickness

n_i: the refractive indices for the sodium d-line of the i-th lens

ν_i: Abbe numbers of the i-th lens,

the radii r_1 to r_{12}, the thickness and separations d_1 to d_{11}, the refractive indices n_1 to n_6, and Abbe numbers ν_1 to ν_6 of said first to sixth lenses L_1 to L_6, respectively, satisfy the following conditions:

$F = 100$

$F_1 = -100.46 = F/-0.922$

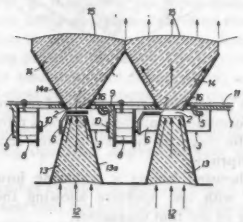
$F_{1.2.3} = 64.31 = F/1.555$

Lens	Radius of Curvature r	Lens Thickness or Distance d	Refractive Index n	Abbe No.
L_1	r_1 =227.78 r_2 =44.46	d_1 =7.14 d_2 =28.92	n_1 =1.51633	ν_1 =64.1
L_2	r_3 =128.22 r_4 =14544.54	d_3 =11.83 d_4 =9.40	n_2 =1.80610	ν_2 =40.8
L_3	r_5 =92.53 r_6 =137.95	d_5 =18.49 d_6 =8.74	n_3 =1.75700	ν_3 =47.9
L_4	r_7 =81.74 r_8 =88.40	d_7 =8.23 d_8 =5.94	n_4 =1.80518	ν_4 =25.4
L_5	r_9 =97.45 r_{10} =48.29	d_9 =9.09 d_{10} =0.57	n_5 =1.75700	ν_5 =47.9
L_6	r_{11} =1008.30 r_{12} =200.02.	d_{11} =11.37	n_6 =1.74320	ν_6 =49.4

3,963,326
DATA DISPLAY PANELS

Claude-Charles Buchert, 10, Boulevard Seneuze, 91440-Bures-sur-Yvette, France

Filed Mar. 5, 1974, Ser. No. 448,318
Claims priority, application France, Mar. 7, 1973, 73.08080; Feb. 5, 1974, 74.03792
Int. Cl.² G05D 24/00
U.S. Cl. 350—266 12 Claims

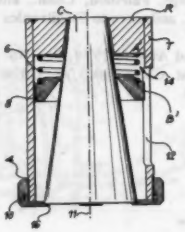


1. A module for a display panel, comprising:
a. a plurality of distinct on-and-off optical systems,
b. each system including an input end, light control means, an output end light transmitting means,
c. said input end including a source surface facing inwardly of said module,
d. said light control means optically associated with said source surface to control the illumination by a light source for selectively illuminating and obscuring said source surface,
e. said output end being spaced from said input end and including an image surface facing outwardly of said module,
f. said image surface being non-coextensive with said source surface, with the plurality of image surfaces being contiguous and having various shapes and sized areas to form a cohesive, substantially continuous display area,
g. said light transmitting means extending between said source surface and said image surface for reverberating the illuminated or obscured state of said source surface to said image surface thereby bringing said image surface to a corresponding state of illumination or obscurity.

3,963,327
DEVICE FOR OPERATING FRUSTO-CONICAL OPTICAL CONCENTRATORS

Albert Poirier, Saint-Benoit, France, assignor to Ulnic France, Paris, France

Filed Nov. 25, 1974, Ser. No. 527,113
Claims priority, application France, Nov. 23, 1973, 73.41871
Int. Cl.² G02B 7/18
U.S. Cl. 350—287 6 Claims

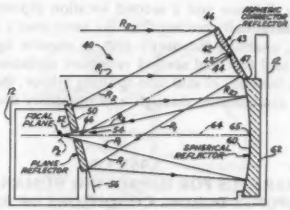


1. A device for operating frusto-conical optical concentrators made of a refringent material of refractive index, n, the major base of which is in the vicinity of a source S, said device comprising, at the upper portion of a frustum of a cone, a frusto-conical reflector surrounding said frustum over a given height along the frustum axis of symmetry, the inner surface of said frusto-conical reflector being parallel to the frustum lateral surface and located at a small distance therefrom, and said given height being at least equal to the ordinate of a point A as measured along the frustum axis of symmetry from the apex of said frustum, point A being the point at which the ray emitted by source S, which is the most inclined ray with respect to the frustum axis of symmetry, undergoes its first reflection on the frustum surface at an angle to the normal to the frusto-conical lateral surface at point A, said angle being smaller than the angle of total reflection.

3,963,328
WIDE FIELD REFLECTIVE OPTICAL APPARATUS

Irving R. Abel, Lexington, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 297,028, Oct. 12, 1972, Pat. No. 3,811,749. This application Jan. 17, 1974, Ser. No. 434,210
Int. Cl.² G02B 17/06
U.S. Cl. 350—294 3 Claims



1. A wide field reflective imaging system comprising:
a spherical reflector having a focal plane;
an aspheric reflector tilted around an axis of rotation for reflecting radiation; and
a plane reflector for reflecting radiation received from the aspheric reflector on to the spherical reflector, wherein the plane reflector defines a plane that intersects the optical axis of the spherical reflector at a predetermined

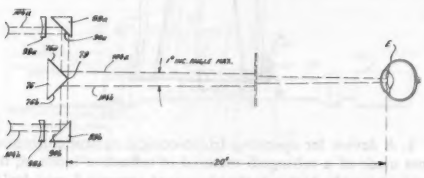
point and wherein the sum of the length of the optical axis between the spherical reflector and said plane and the distance between said point and the center of the aspheric reflector equals the radius of spherical reflector, whereby an image of at least part of the radiation received by the aspheric reflector is formed on the focal plane.

3,963,329

SMALL PUPIL BINOCULAR INDIRECT OPHTHALMOSCOPE

Joseph G. Stumpf, Fairfield, Conn., and Walter M. Lewis, Wilmette, Ill., assignors to Frigitronics of Conn., Inc., Shelton, Conn.

Filed Aug. 5, 1974, Ser. No. 494,820
Int. Cl.² A61B *3/12*; G02B *27/02*
U.S. Cl. 351—6 **6 Claims**



1. In a binocular indirect ophthalmoscope of the type having a horizontal mirror housing surmounted by a vertical lamp housing, a light source within the lamp housing, an illuminating mirror for directing light from the source into a patient's eye, V-shaped side-splitting mirror means centrally positioned in said mirror housing having first and second angled reflective surfaces for receiving light reflected from the patient's eye and directing it toward opposite ends of said mirror housing, and left and right ocular assemblies adjustably mounted in said mirror housing, each of said assemblies including a member defining an aperture for a user's eye and an angled mirror for directing light from a respective one of said reflective surfaces through said aperture, the improvement which comprises: the left and right optical axes between the side-splitting mirror means and a patient's eye including a maximum angle of 1°; the optical axis of the light source and the plane of the left and right optical axes of the ocular assemblies defining a maximum included angle of substantially 2°, measured between the ophthalmoscope and a patient's eye; and said ocular assemblies being sufficiently movable within said mirror housing that said assemblies are adjustable between a first location separated by a distance substantially equal to the user's interpupillary distance and a second location separated by a distance substantially greater than the same user's interpupillary distance, enabling the user's eyes to receive light from portions of said first and second reflective surfaces immediately adjacent the apex of said side-splitting mirror, thereby permitting eye examination through a substantially undilated pupil.

3,963,330

APPARATUS FOR IMPROVING HUMAN VISUAL RESPONSE DURING CONDITIONS OF REDUCED AMBIENT ILLUMINATION

Vivien Boniuk, 200 E. End Ave., Apt. 1C, New York, N.Y. 10028

Filed Dec. 20, 1973, Ser. No. 401,815
Int. Cl.² G02C *7/10*; G02B *5/28*
U.S. Cl. 351—163 **8 Claims**

1. A lens for improving the vision of persons having eyes essentially correctible to the emmetropic state under conditions of relatively low intensity ambient illumination, said lens having curved front and rear surfaces, the sum of the powers of said surfaces being in the range of between about minus 0.12 to 1.50 diopters, and said lens having filter means integral

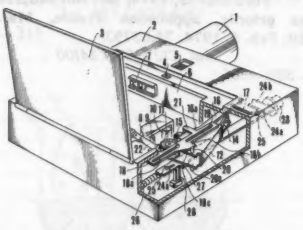
therewith for attenuating radiation transmitted through said lens of wavelengths below about 5000–5500 A.

3,963,331

CAMERA CAPABLE OF SIMULTANEOUS SOUND RECORDING

Yoshio Komine, Tokyo; Kazuya Hosoe, Machida; Mamoru Shimazaki; Toshikazu Ichiyanagi, both of Tokyo, and Kiyoshi Takahashi, Kunitachi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,207
Claims priority, application Japan, Oct. 5, 1973, 48-112635
Int. Cl.² G03B *19/18*
U.S. Cl. 352—29 **4 Claims**



1. A motion picture camera capable of recording the image and sound information simultaneously on a photographic film for which a film magazine housing a sound recording band is provided, comprising:

a camera housing having a magazine housing chamber provided with one aperture allowing the loading and unloading of the film magazine;

an opening and closing cover for selectively covering said aperture of said magazine housing chamber;

film driving means;

a release control means for selectively controlling the starting and stopping of said driving means, said release control means being controllable from outside said housing;

an image-forming means for forming image information on said photographic film;

a sound recording means, said means having the following elements disposed on the opposite sides of a film passage with said film pinched therebetween:

a transducing head means capable of recording said sound information on said magnetic recording band incorporated in said film;

a head pad member for contacting with pressure said transducing head means with said film so as to allow an optimum condition, said head pad member being selectively shiftable between a first position in which it functionally is brought into pressurized contact with said transducing head means, a second position in which it keeps a slight gap with regard to said transducing head means and a third position in which said gap between two members becomes wide enough to simplify exchanging the loading and unloading of the film;

a first film transport means for feeding film to the picture image forming position of said picture image forming means;

a second film transport means for said film continuously feeding at least between said transducing head means and said head pad member, said second film transport means having the following elements located respectively at opposite sides pinching said passage of the film therebetween: a capstan, a rotatable pinch roller, said pinch roller being shiftable between a first position in which said pinch roller is functionally engaged with said capstan permitting thereby the feeding of said film, a second position in which a slight gap is set up so as to make impossible the transport of the film, and a third position in which the pinch roller is widely separated from said capstan so that the loading and unloading of the film magazine may be performed, while the feeding of the film is made impossible;

a shift means control for controlling the shifting motion of said head pad member and said pinch roller, said means being selectively shifted between a first position for holding said head pad member and said pinch roller together in said first position, a second position in which said head pad member and said pinch roller are held in said second position and a third position in which said head pad member and said pinch roller are held at said third position;

a first energizing means, for energizing said shift control means which is maintained directed toward said first position by axially directed spring pressure;

a first energizing means for energizing said shift control means always in the direction of said first position;

a first member shiftable from an allowing position in which said shift control means is allowed to shift from said third position to said second position, to an engaging position in which said shift control means is forcedly shifted from said second position to said third position against the energizing force of said first energizing means, said member being mechanically linked to a part of said open-and-close cover so that when said open-and-close cover is closed, said member is forcedly shifted from said engaging position to said allowing position, directly subjected to a closing pressure necessary for the closing operation applied to said open-and-closed cover, and when said open-and-close cover is opened, said member is forcedly shifted from said first position to said second position, directly subjected to an opening pressure necessary for the opening operation applied to said open-and-close cover;

a second member capable of shifting toward a first position in which said shift control means is allowed to shift said second position and a second position in which said shift control means is forcedly shifted from said first position to said second position against the energizing force of said first energizing means, said member being mechanically linked with said release control means, so that said member is shifted to said first position in association with the action of said release control means, and shifted to said second position in relation with the stopping of the operation; and

an energizing member for energizing said second member so as to be energized for being shifted in such a manner that said member is always capable of being shifted toward said second position, the energizing force of said energizing member being greater than that of said energizing means of said first means.

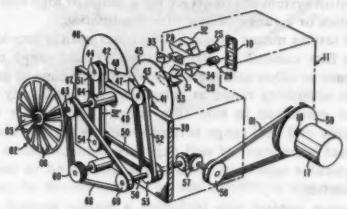
3,963,332

3 DIMENSION PROJECTOR

Stewart L. Sheldon, 19 Nona Drive; Wilbur R. Horstman, 6 W. Sherry Drive, and Robert G. Gump, 506 W. Sherry Drive, all of Trotwood, Ohio 45426

Filed May 8, 1972, Ser. No. 251,082
Int. Cl.² G03B *35/08*
U.S. Cl. 352—60 **5 Claims**

1. Projector apparatus embodying a film gate and means for moving film through said gate in intermittent fashion to simultaneously present at said gate right and left eye images of a scene provided in succession on the film, characterized by means for differentially projecting said right and left eye images toward a viewing surface in time spaced superposing relation, said last named means including a pair of rotatable disc shutters, one in the path of each projected right and left eye image, apertures in respective shutters being differentially located in a circumferential sense, the aperture in one of said



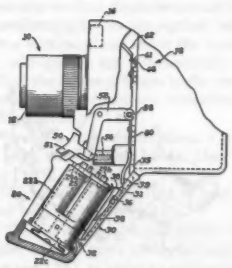
pair of shutters providing for greater angular exposure than the aperture of the other of said pair of shutters for a projection of differential increments of right and left eye images in time spaced superposing relation and said means for differentially projecting right and left eye images further including a rotatable disc shutter common to projected right and left eye images and comprising a plurality of uniformly spaced apertures in annular arrangement.

3,963,333

CAMERA CONTROL SYSTEM

Arthur C. Mueller, Niles, and Erwin E. Figge, Des Plaines, both of Ill., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 371,817, June 20, 1973, abandoned.
This application Feb. 25, 1974, Ser. No. 445,469
Int. Cl.² G03B *23/02*
U.S. Cl. 352—72 **11 Claims**



1. In a cassette-load movie camera having a film and shutter drive motor and an exposure control system including a light-sensitive cell for automatically setting the camera exposure in response to the quantity of light incident upon the light-sensitive cell, and an electrical power source for the drive motor and the exposure control system, a camera control system for

adjusting the exposure control system to the sensitivity of the film contained in the cassette and for controlling the energization of the exposure control system in relation to energization of the drive motor comprising:

variable neutral density filter means positioned in optical alignment with said light-sensitive cell for selectively altering the quantity of light incident upon said cell;

filter setting means responsive to indicia provided on the film cassette to effect a particular neutral density setting for said variable neutral density filter means related to the sensitivity of the film in said film cassette;

sensitivity range control means for adjusting said exposure control system alternatively for a range of high film sensitivities or a range of low film sensitivities;

range setting means responsive to other indicia provided on the film cassette to effect setting of said range control means to either said high film-sensitivity range of said low film-sensitivity range as related to the sensitivity of the film contained in said film cassette, said filter setting means and said range setting means being correlated to effect adjustment of said exposure control system to the particular sensitivity of the film contained in said film cassette;

a camera control grip including a master control switch means normally biased to an open condition and adapted in closed condition to connect said exposure control system to said power source and a motor control switch means normally biased to an open condition and adapted in closed condition to connect said power source to said drive means, said master control switch means and said motor control switch means being arranged so that normal manual grasping of said grip closes said master control switch means before said motor switch means can be closed so that said exposure control system is energized before energization of said drive motor; and

an electrical circuit arranged to connect said power source to said drive motor and said exposure control system and effective to render said motor control switch inoperative to energize said drive motor until said master control switch means is closed.

3,963,334

FILM TRANSPORT APPARATUS FOR A MOTION PICTURE CAMERA OR PROJECTOR

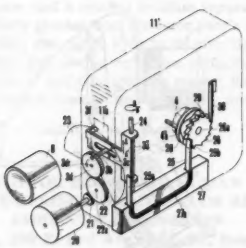
Mamoru Shimazaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1974, Ser. No. 525,628

Claims priority, application Japan, Nov. 27, 1973, 48-137217; Dec. 21, 1973, 49-796

Int. Cl.² G03B 1/22

U.S. Cl. 352—191 **9 Claims**



1. Film transport apparatus for a motion picture camera, projector, and the like utilizing film housed in a magazine, comprising, in combination:

a. an aperture plate;

b. a film guide means to guide film to a prescribed position on said aperture plate;

c. film binding means for stabilizing said film on said aperture plate;

d. film feeding means for intermittently driving said film on said aperture plate overcoming the film binding force of said film binding means, said film feeding means including

a film advancing member having a film advancing claw thereon and means mounting said film advancing member to enable said film advancing member to effect linear reciprocal movement along the running direction of the film and rotative reciprocal movements in directions perpendicular to said running direction so as to allow the film advancing claw to effect

a first shifting movement in a direction generally perpendicular to the film running direction for engaging perforations in said film,

a second shifting movement through a predetermined distance from said engaged position along the running direction of the film while engaged with the perforations of the film,

a third shifting movement in a direction generally perpendicular to the running direction of film away from the film for disengaging said claw from the film perforations, and

a fourth shifting movement to the position where said first shifting movement is started from the position at which said third shifting movement is completed with said claw disengaged from the film perforations;

a driving motor;

a driving power transmission control means mechanically linked with said driving motor and with said film advancing member for transmitting the output of said driving motor to the film advancing member for controlling shifting of the film advancing member;

e. film take-up means for winding film which has run past said aperture plate at a predetermined position including

a film take-up reel driving member to provide film take-up action,

a first rotating member for rotating said film take-up reel driving member in a forward direction through a rotating locus, said film take-up reel driving member being provided as a part of said first rotating member,

a second rotating member rotatable in a forward or reverse direction in accordance with rotating force delivered thereto, and

one-way clutch means engaged between said first and second rotating members for imparting to said first rotating member forward rotating force from said second rotating member but to prevent driving engagement therebetween during reverse rotation of said second driving member;

f. actuating means for driving said film take-up means including

shifting means for effecting reciprocal movement in a linear path in collabration with the linear reciprocal movement along the running direction of the film by said film advancing member, said shifting means being provided on said film advancing member, and

movement conversion means for converting linear movement of said shifting means to repeated rotating movement and to transmit said movement to said second rotating member, said conversion means being mechanically linked with said shifting means and said second rotating member, said second rotating member being rotated in a forward direction by movement of said shifting means as said film advancing member is shifted to effect said second shfting movement of said film advancing claw while said second rotating member is rotated in a reverse direction by movement of said shifting means as said film advancing member is shifted to effect said fourth shifting movement of said film advancing claw;

said film take-up means being activated only when film is running on said aperture plate, with said film being bound

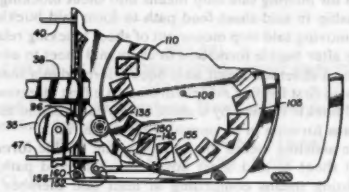
on said aperture plate when said film is not running thereby stabilizing the film on said aperture plate.

3,963,335

MAGNETIC TAPE CARRIER

Emory Horvath, 7065 Overbrook Drive, Longmont, Colo. 80501

Filed June 5, 1975, Ser. No. 584,178
Int. Cl.² G03B *31/00*
U.S. Cl. 353—15 21 Claims



1. An enclosed tape and film cartridge comprising, a casing having a flexible and movable shutter closing an opening at one end of the casing, means in the casing for opening and closing the shutter, an endless magnetic tape system including a tape spool with tape thereon and with guide members and a drive capstan positioned within the casing with the guide members and the drive capstan directing a loop of the tape from the spool across the opening in one end of said casing, a film disc mounted in the casing and adapted to be rotated such that the film therein will be brought into optical alignment with aligned transparent sections with the casing to permit light to be directed through the casing and through the film in the disc therein, a floating post mounting said film disc, drive roller means positioned on said drive capstan for rotating a disc through a frictional type of drive connection, and selectively operated brake means gripping the film disc and restraining said disc against movement of the frictional drive connection until said brake means is released.

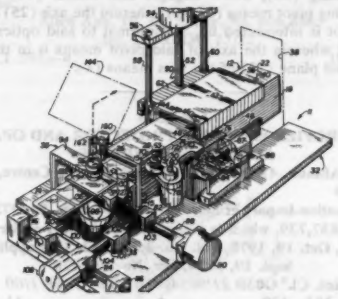
3,963,336

FILM STRIP HANDLING APPARATUS AND METHOD

James O. Haning, Palo Alto; Bram Kool, Santa Clara County; Jules G. Moritz, Saratoga, and Robert Mizrahi, El Cerrito, all of Calif., assignors to Microform Data Systems, Inc., Mountain View, Calif.

Division of Ser. No. 313,902, Dec. 11, 1972, Pat. No. 3,909,122, which is a division of Ser. No. 101,224, Dec. 24, 1970, Pat. No. 3,743,400. This application Dec. 26, 1974, Ser. No. 536,510
Int. Cl.² G03B *23/00;* B65H *3/06;* B65D *85/48*
U.S. Cl. 353—26 A 4 Claims

1. In information retrieval apparatus: a cassette having an open end, a pair of opposed sides, and means on the inner surfaces of the sides for mounting a number of strips in stacked relationship therewith with each strip being movable relative to the sides at least partially out of the cassette through said open end, said cassette having a recess in one side thereof through which a portion of one side edge of each strip is thus engageable by edge drive means, whereby each



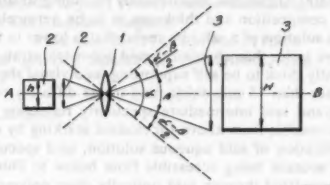
strip can be moved relative to said cassette in opposed directions.

3,963,337

STILL PROJECTOR WITH SINGLE-ACTING COMPENSATION DEVICE

Jan Agnar Lundberg, Torslanda, Sweden, assignor to Fritz Victor Hasselblad, Goteborg, Sweden

Filed May 12, 1975, Ser. No. 576,365
Claims priority, application Sweden, May 21, 1974, 7406706
Int. Cl.² G03B *21/00*
U.S. Cl. 353—70 6 Claims



1. A still projector equipped with a device for compensating for angular errors caused by projection deviation from the normal in a vertical plane, wherein the device includes means for rendering possible vertical displacement of the lens of the still projector perpendicular to its optical axis, a lighting means pivotal in a vertical plane about the centre of a transparent original, and means for automatically directing the paraxial ray path of the lighting means to the rear nodal point of the lens, wherein the improvement comprises:

a projector housing (13);

a lens means having a rear model plane, a holder for said lens means (12), wherein said holder (14) is mounted in said housing (13);

a set screw (15) rotatably supported in said housing (13) and threaded with said holder (14);

guide means (17) registered with said holder (14) for limiting said holder (14) to vertical displacement upon rotating said set screw (15), in order to vertically displace said lens (1);

a lamp housing (26) having sides and rotatably supported by the projection housing (13) for rotation about a horizontal axis located through the center (M) of the transparent original (2), in a plane defined by the original;

lamp and optical means (5–10) mounted in said lamp housing for defining an optical axis (26);

coupling means for coupling the lamp housing (26) to the holder (14), wherein said coupling means includes at least one driving arm (30), extending from said lamp housing (26), which engages said holder (14) with a sliding pivot means (25,31), wherein the axis (25) of said pivot is intersected by, and normal to said optical axis, and wherein the axis of said pivot means is in the rear nodal plane (12) of the lens means (1).

3,963,338

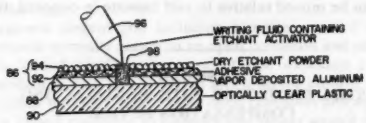
LOW PROFILE EPISCOPIC PROJECTOR AND OPAQUE MATERIALS THEREFOR

Gerald Altman, 41 Westminster Road, Newton Centre, Mass. 02159

Continuation-in-part of Ser. No. 329,574, Feb. 5, 1973, Pat. No. 3,837,739, which is a continuation-in-part of Ser. No. 81,987, Oct. 19, 1970, Pat. No. 3,778,142. This application Sept. 19, 1974, Ser. No. 507,478

Int. Cl.[2] G03B *21/00*; G02B *5/08*; C23F *1/00*

U.S. Cl. 353—120 **11 Claims**



1. A visual graphic sheet for receiving indicia for optical projection, said visual sheet comprising, in laminated sequence, an upper diffusely reflecting stratum, an intermediate specularly reflecting stratum, and a lower optically clear polymeric stratum, said specularly reflecting stratum being composed of vapor deposited aluminum ranging in thickness from 500 to 2500 Angstroms, said diffusely reflecting stratum being of such composition and thickness as to be permeable to an aqueous solution of a salt of a metal that is lower in the electromotive series than aluminum, said polymeric stratum being sufficiently thick to be self supporting, said visual sheet being no greater than 15 mils thick, said upper diffusely reflecting stratum and said intermediate specularly reflecting stratum being accessible from above for manual marking by differential application of said aqueous solution, said specularly reflecting stratum being accessible from below to illuminating light transmitted through said optically clear polymeric stratum.

3,963,339

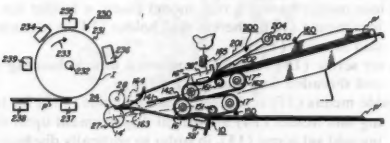
SHEET FEEDING APPARATUS

Thomas N. Taylor, Rochester, and Wayne F. Schoppe, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 5, 1974, Ser. No. 503,221

Int. Cl.[2] G03G *15/00*; B65H *3/04*, *3/44*, *9/06*

U.S. Cl. 355—3 R **26 Claims**



1. A sheet feeding apparatus including:

means for feeding a sheet along a sheet feed path;

stop means for intercepting an edge of said sheet to allow a buckle to form in said sheet;

means for moving said stop means into sheet blocking relationship in said sheet feed path to form said buckle and for moving said stop means out of sheet blocking relationship after buckle formation to allow said sheet to continue along said path;

chute means for guiding said sheet during buckling and for acting on the buckle as said stop means moves out of sheet blocking relationship to assist said sheet in continuing along said path and to assist in flattening said buckle, said chute means being movably mounted and being connected to said stop means so as to move in the sheet feeding direction.

11. A sheet feeding apparatus including:

a first means for feeding a sheet from a first stack of sheets along a sheet feed path;

a second means for feeding a sheet from a second stack of sheets along said sheet feed path;

stop means for intercepting an edge of a sheet fed by either said first feeding means or said second feeding means to allow a buckle to form in said sheet;

means for moving said stop means into sheet blocking relationship in said sheet feed path to form said buckle and for moving said stop means out of sheet blocking relationship after buckle formation to allow said sheet to advance along a sheet feed path, said buckle formed in a sheet fed by said first feeding means forming in a first direction and said buckle formed by a sheet fed by said second feeding means forming in an opposing direction; and

buckle assisting means for flattening said buckle formed in said sheet as said sheet advances along said path, said assisting means comprising at least one member positioned to be biased against a buckle formed in said first direction or a buckle formed in said opposing direction.

3,963,340

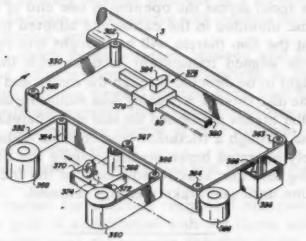
IMAGING APPARATUS FOR TYPEWRITER EMPLOYING ELECTROSTATIC PRINTING PROCESS

Robert E. Gerace, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1975, Ser. No. 569,239

Int. Cl.[2] G03G *15/22*

U.S. Cl. 355—3 R **21 Claims**



1. Imaging apparatus comprising:

a. an elongate platen for supporting a receiving medium;

b. a web of electrically insulating material formed into a closed loop supported for translation along a predetermined path, the predetermined path at least, in part, running parallel to and adjacent the surface of said platen;

c. means for bringing a layer of electrically photosensitive marking material structurally fracturable in response to (1) an electrical field less than the electrical breakdown potential of the layer and (2) exposure to electromagnetic radiation to which the layer is sensitive into contact with said insulating web and separating it therefrom prior to reaching that portion of the predetermined path adjacent said platen;

d. means to advance said insulating web through the predetermined path;

e. activation means positioned relative to the predetermined path to activate the photosensitive layer to render it fracturable;

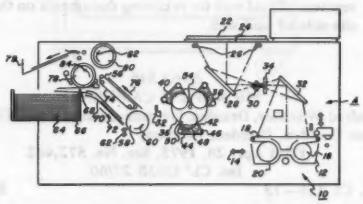
f. imaging means positioned relative to the portion of the predetermined path where the photosensitive layer and said web are in contact to create a latent image in the photosensitive layer;

g. transfer means positioned relative to the predetermined path after separation of said insulating web and the photosensitive layer to transfer the marking material image to the receiving medium, said transfer means comprising web displacement means and web displacement drive means for contacting the web displacement means to said insulating web on the surface opposite the marking material image bearing surface, to temporarily displace the web in a direction substantially transverse to the advancing direction of the web along the predetermined path, to press the marking material image against the receiving medium.

3,963,341
COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE

Michael J. Tully, Framingham, Mass., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,542
Int. Cl.² G03G *15/01, 15/09*
U.S. Cl. 355—4 **9 Claims**



1. An electrophotographic printing machine for reproducing a colored original document on a sheet of support material including:

a photoconductive member arranged to have a charge pattern recorded thereon without being pre-charged;

means for exposing said photoconductive member to successive color filtered light images to record successive charge patterns thereon, each charge pattern corresponding substantially to a discrete color contained in the original document;

a plurality of magnetic members, each of said magnetic members having differently colored magnetic particles, complementary in color to the filtered light image, adhering thereto;

a frame member mounted rotatably in the printing machine and having said plurality of magnetic members mounted thereon;

means for rotating said frame member to position successive magnetic members closely adjacent to said photoconductive member with the magnetic particles adhering thereto contacting said photoconductive member;

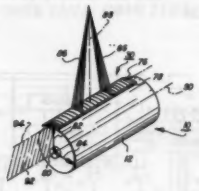
means for transferring, in superimposed registration, successive single color powder images from said photoconductive member to the sheet of support material; and

means for permanently affixing the superimposed powder images to the sheet of support material forming a colored copy of the original document.

3,963,342
CURVED SCREEN

Howard M. Stark, Webster, and Robert N. Goren, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 10, 1975, Ser. No. 566,886
Int. Cl.² G03G *15/22*
U.S. Cl. 355—4 **10 Claims**



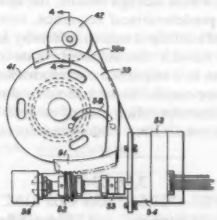
1. An electrophotographic printing machine of the type having an arcuate photoconductive member, including:

an arcuate screen member having a curvature substantially equal to the curvature of the photoconductive member, said screen member being mounted in the printing machine with the centers of curvature of the photoconductive member and said screen member being in substantial coincidence with one another.

3,963,343
CAMMING SYSTEMS

Cornelius J. de Keyzer, Venray, Netherlands, assignor to Rank Xerox Ltd., London, England

Filed Oct. 2, 1974, Ser. No. 511,350
Claims priority, application Netherlands, Jan. 7, 1974, 7400212
Int. Cl.² G03G *15/28*
U.S. Cl. 355—8 **6 Claims**



1. A xerographic reproduction machine comprising a movable xerographic plate, scanning means for projecting an image of the object to be reproduced onto the xerographic plate, means for varying magnification of the projected image, the scanning means including an oscillatable mirror and a camming system for oscillating said mirror, said camming system comprising a cam, a cam follower, means to drive the cam follower to and from a start of scan position while in contact with the cam, and means to rotate said cam about an axis outside the cam.

3,963,344
PHOTOGRAPHIC PRINTING APPARATUS WITH REDUCED NUMBER OF INPUT MEANS FOR ENTERING CORRECTION VALUES

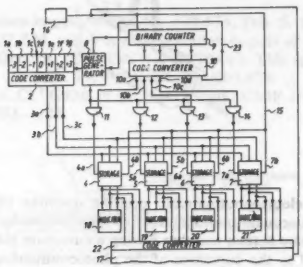
Friedrich Hujer, Grunwald; Volker Weinert, Munich, and Harald Fengler, Taufkirchen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Oct. 17, 1974, Ser. No. 515,630

Claims priority, application Germany, Oct. 20, 1973, 2352765

Int. Cl.² G03B 27/76

U.S. Cl. 355—35 **17 Claims**



1. Photographic printing apparatus for making a print from an original, said printing apparatus having compensating circuits responsive to a plurality of stored correction signals each representing a selected one of a predetermined plurality of values for one of a determined number of correction factors required for compensating for deviations of a corresponding photographic characteristic of said negative from a desired value of said characteristic, the improvement, comprising, in combination, a plurality of input means corresponding in number to said plurality of values but independent of the number of said correction factors, each for furnishing an input signal corresponding to a selected one of said values upon external activation; a plurality of storage means, each having a storage input connected to all of said input means and an enabling input, for storing the signal applied to said storage input only in the presence of a signal at said enabling input; and gating means connected to said input means and said enabling inputs of said storage means, for enabling said storage means in a predetermined sequence, one in response to each activation of said input means, whereby activation of said input means to furnish the selected value of each of said correction factors in a sequence corresponding to said predetermined sequence causes the so-selected values to be entered in turn into the corresponding one of said storage means, the so-stored values constituting said stored correction signals.

3,963,345
PRE-COLLATION COPYING

Denis J. Stemmle, Williamson, and Morton Silverberg, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1975, Ser. No. 560,756

Int. Cl.² G03B 27/48, 27/50, 27/62, 27/64

U.S. Cl. 355—50 **4 Claims**

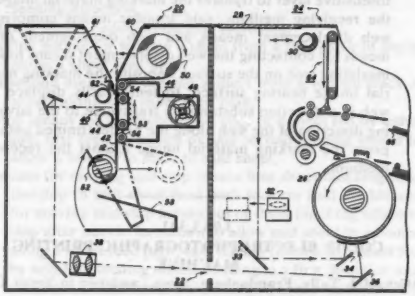
1. In an automatic document handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original documents, the improvement comprising:

an elongated windable document holding web;

means for forming a spaced pair of oppositely wound scrolls of said web for winding up a set of documents on said web therein and retaining said documents between turns of said web on both said web scrolls;

said web having a minor intermediate unwound segment extending between said web scrolls;

means for recirculatingly winding and unwinding said web between one said web scroll and the other said web scroll to recirculatingly expose individual documents on said intermediate segment of said web between said web scrolls in a pre-collated order; and



optical imaging means for imaging documents on said intermediate segment of said web between said web scrolls for copying said documents;

wherein said web is air permiable and wherein vacuum means are provided on one side of said intermediate segment of said web for retaining documents on the opposite side of said web.

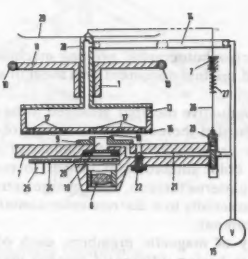
3,963,346
MICROFILM CAMERAS

Manfred Wiessner, Dresden, Germany, assignor to VEB Pentacon Dresden, Dresden, Germany

Filed Apr. 28, 1975, Ser. No. 572,462

Int. Cl.² G03B 27/60

U.S. Cl. 355—73 **8 Claims**



1. A microfilm camera comprising:

a. a picture gate having film contact surfaces,

b. a suction plate for holding a sheet of film which can be moved in steps across the picture gate,

c. an objective lens,

d. a chamber formed between the objective lens and the contact surfaces of the picture gate,

e. a glass plate forming one end of said chamber,

f. a vacuum pump,

g. a suction conduit connected between said chamber and said vacuum pump, and

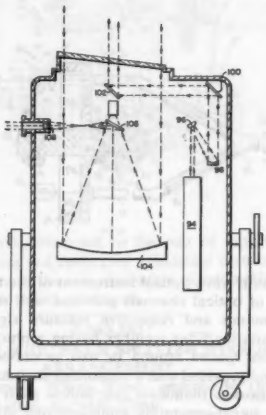
h. a valve for closing the path between said chamber and the pump.

3,963,347

ERBIUM LASER CEILOMETER

Joseph Pipo Segre, Newton Center, and Norman R. Truscott, Whitinsville, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 9, 1974, Ser. No. 468,342
Int. Cl.² G01C 3/08
U.S. Cl. 356—5 8 Claims



1. A laser rangefinder comprising a laser generator for generating laser light at 1.54 microns comprising an erbium doped laser rod and means for pumping said laser rod, said laser rod being positioned in optical alignment in an optically regenerative laser cavity, said cavity being formed by forward and rearward reflectors, the forward reflector comprising a rotating saphire flat, and the rearward reflector comprising saphire flats and a quartz flat; a monitor for monitoring the outgoing laser pulse emitted by said generator; a detector for detecting light generated by said laser and reflected back to said rangefinder; a parabolic reflector for focusing light onto said detector; said detector being positioned at the focal point of said reflector; an infrared transmitting window in the optical path of laser light reaching said detector, said window allowing no transmission of light in wavebands below 1.2 microns or above 1.6 microns; and means for aligning the outgoing laser pulse along the optical axis of said parabolic reflector to align the outgoing pulse with the detector and thereby reduce parralax, and wherein said window is formed of glass having the following composition:

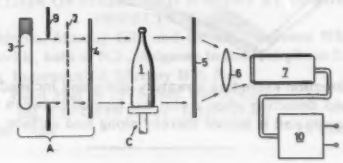
Component	Amount in % by Weight
SiO_2	51.90
Na_2O	6.50
K_2O	6.80
CaO	6.50
Al_2O_3	1.40
ZnO	2.20
TiO_2	.40
Sb_2O_3	.40
MgO	23.40
Cr_2O_3	.50.

3,963,348

DEVICE FOR DETECTING STRAIN AND FOREIGN MATTERS IN GLASS CONTAINER BY A NON-STORAGE TYPE PICKUP TUBE

Satoshi Nakatani, Nishinomiya, and Yoichi Ito, Amagasaki, both of Japan, assignors to Yamamura Glass Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 379,393, July 16, 1973, abandoned. This application June 5, 1975, Ser. No. 584,047
Claims priority, application Japan, July 14, 1972, 47-71058; Mar. 29, 1973, 48-36464
Int. Cl.² G01B 11/18; G01N 21/04, 21/16
U.S. Cl. 356—33 9 Claims



1. A device for detecting strain and foreign matter in a glass container, comprising:

means for moving a glass container;

a light source located on one side of the glass container placed and moving means;

a polarizer transmittting vibration only in one direction of light from said light source and located between the light source and the glass container;

an analyzer placed on the other side of the glass container so that the optical axis of the analyzer intersects that of the polarizer at right angles;

means for rotating said glass container on said moving means.

a non-storage type pickup tube for receiving on a photoelectric surface thereof an image of the glass container placed on said movi..g means;

position detecting means for detecting from said moving and feed means the position and speed of the glass container;

said non-storage type pickup tube being provided so that the image on the photoelectric surface thereof of the glass container in rotational movement is always scanned along the center line in a longitudinal direction in synchronism with the speed of movement of the glass container, whereby:

an abnormal electrical output of the image of the glass container due to light depolarized by foreign matter in the glass container and double deflection caused by strain in the glass container is detected from a constant electrical output of the image changed photoelectrically by the non-storage type pickup tube to thus ensure the rejection of a defective glass container.

3,963,349

METHOD AND APPARATUS FOR DETERMINING COAGULATION TIMES

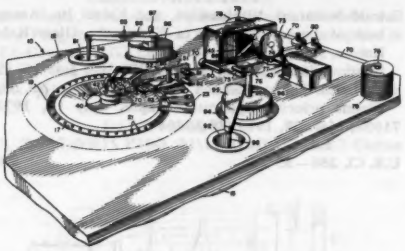
Bill E. Albright, Hialeah, and Stephen M. Meginniss, III, St. Petersburg, both of Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 27, 1974, Ser. No. 500,910
Int. Cl.² G01N 33/16, 21/16, 31/00
U.S. Cl. 73—64.1 40 Claims

1. A method for determining the coagulation time of a fluid following the addition of a coagulating agent thereto, comprising the steps of

supporting a body of said fluid in a recess having a generally smooth non-wettable inclined surface, introducing a predetermined volume of a coagulating agent into said body to initiate a coagulation reaction, simultaneously drawing

a pair of spaced, parallel, and fibrous filaments at the same rate through said body within said recess and in a



direction extending upwardly along said inclined surface, and detecting when a clot has formed between said filaments and is moved thereby along said surface.

3,963,350
APPARATUS FOR SELECTIVELY SEGMENTING RED AND WHITE BLOOD CORPUSCLES CONTAINED IN BLOOD SMEAR

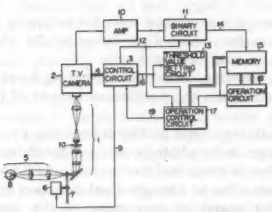
Sadakazu Watanabe, Kawasaki, and Hidenori Shinoda, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Nov. 12, 1974, Ser. No. 523,056

Claims priority, application Japan, Nov. 13, 1973, 48-126782

Int. Cl.² G01M *33/16*; G01N *21/06*

U.S. Cl. 356—39 **6 Claims**



5. An apparatus for selectively segmenting red blood corpuscles and white blood corpuscles of a blood sample comprising:

means for successively illuminating said sample with monochromatic light having a first wavelength between 400 nm and 430 nm and with monochromatic light having a second wavelength between 500 nm and 560 nm,

means for detecting light passing through said sample and producing a first detected electrical signal which varies as a function of the intensity of light received at said first wavelength and a second electrical signal which varies as a function of the intensity of light received at said second wavelength,

means for comparing said first detected signal with a first electrical threshold signal and producing a first binary signal having one binary value when said first detected signal is above said first threshold signal and the second value when the first detected signal is below said first threshold signal,

means for comparing said second detected signal with a second electrical threshold signal and producing a second binary signal having one binary value when said second detected signal is above said second threshold signal and the other binary value when said second detected signal is below said second threshold signal,

means for logically combining said first and second binary signals to produce an output indicating whether said second binary signal is produced by illuminating a red or white corpuscle.

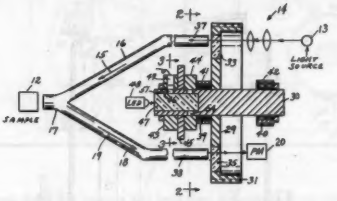
3,963,351
MULTI-CHANNEL OPTICAL TIME-SHARING APPARATUS HAVING A ROTATING FILTER WHEEL WITH POSITION-ENCODING MEANS

Britton Chance; Victor Legallais; John R. Sorge, and Norman C. Graham, Jr., all of Philadelphia, Pa.

Filed Apr. 14, 1975, Ser. No. 567,946

Int. Cl.² G01J *3/30*, *3/48*

U.S. Cl. 356—85 **17 Claims**



4. In a multi-wave optical instrument of the type including a plurality of optical channels provided with respective gain equalizer means and respective measure signal detection means, a rotating filter member having a plurality of wavelength filters spaced around its axis to define said optical channels and provided with a supporting shaft having a hollow portion, means to illuminate said hollow shaft portion internally, first signal-generating photosensitive means mounted adjacent said hollow shaft portion, said hollow shaft portion having means formed to illuminate said first photosensitive means so as to generate cyclically relatively long pulses, second signal-generating photosensitive means mounted adjacent said hollow shaft portion, said hollow shaft portion having means formed to illuminate said second photosensitive means so as to generate cyclic sets of short pulses, and means to decode said long pulses and short pulses respectively to derive cyclic gating pulses for said gain equalizer means and cyclic gating pulses for said measure signal detection means.

3,963,352
WHEEL ALIGNMENT APPARATUS

Sigurd A. Rishovd, Golden Valley, and Richard P. Vizenor, Columbia Heights, both of Minn., assignors to Royal Industries, Inc., Pasadena, Calif.

Continuation of Ser. No. 212,773, Dec. 27, 1971, abandoned, Continuation of Ser. No. 706,270, Feb. 19, 1968, abandoned.

This application Oct. 24, 1973, Ser. No. 409,134

Int. Cl.² G01B *11/26*, *19/80*

U.S. Cl. 356—152 **24 Claims**

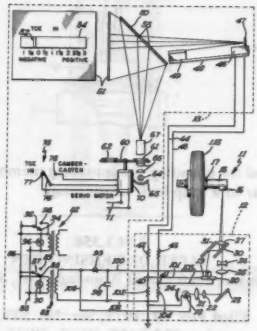
12. Apparatus for determining the alignment of a vehicle wheel comprising:

a. a first means adapted to be disposed upon a wheel of a vehicle;

b. a second means adapted to be disposed adjacent said wheel of a vehicle;

c. one of said means including means for angularly, adjustably disposing said one of said means, one of said means including a source of light radiant energy and a pair of radiant energy sensing means and the other of said means including means for reflecting radiant energy, whereby a beam of radiant energy from one of said means if reflected from the other of said means in equal amount to each of the pair of radiant energy sensing means when the axis of rotation of a wheel is in a predetermined relation-

ship to an axis normal to the effective plane of reflection of the means for reflecting radiant energy on said other of said means; and

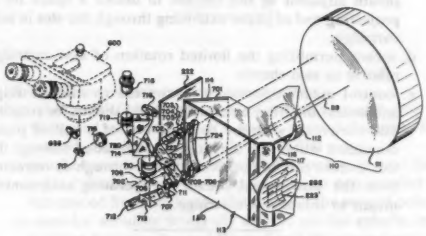


d. meter means connected to the pair of radiant energy sensing means and calibrated to indicate units of relative displacement of the axis of rotation of said vehicle wheel from a predetermined attitude.

3,963,353
MONOLITHIC BEAM SPLITTER MIRROR ARRANGEMENT

Harold S. Hemstreet, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 26, 1974, Ser. No. 509,588
Int. Cl.[2] G01B *11/24*; G02B *27/10*
U.S. Cl. 356—168 **4 Claims**



1. In an optical projection system wherein the image of a preselected portion on a master is projected onto a wafer, the projection system including, between the master and the wafer, a plurality of reflective surfaces angularly disposed for folding the optical path of the system, an improved arrangement for viewing the image projected on the wafer comprising:

said reflective surfaces being provided respectively by different reflective faces of a single monolithic structure,

said structure having an aperture therethrough opening through one of said faces, the reflective surface of said one face being provided by a beam splitting plate on the one face and over the opening of said aperture therethrough,

said aperture being aligned for the portion of reimaging light that is reflected back through the system from the wafer and that passes through said beam splitting plate to pass through said structure,

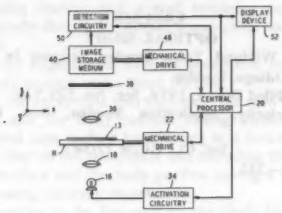
optical correcting means in the path of the portion of reimaging light that passes through said aperture to compensate for distortion introduced in the latter portion of reimaging light by the angle at which this light passes through said beam splitting plate, and

objective lens means and viewing means in the path of light emerging through the optical correcting means for viewing the composite reimage of said portion of the master and the portion of the wafer on which the image of said portion of the master is projected.

3,963,354
INSPECTION OF MASKS AND WAFERS BY IMAGE DISSECTION

Martin Feldman, Murray Hill, and Donald Lawrence White, Bernardsville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 5, 1975, Ser. No. 574,617
Int. Cl.[2] G01B *11/24*; G01N *21/32*
U.S. Cl. 356—168 **33 Claims**



1. An image dissection system for inspecting a member that contains multiple patterns that are nominally identical to each other, said system comprising

means for momentarily illuminating one pattern at a time of the multiple patterns,

an image storage medium,

means responsive to light emanating from the illuminated pattern for impressing images of only spaced-apart portions of said pattern onto said image storage medium,

and means for positioning the images from successive patterns in an interleaved side-by-side way in said image storage medium.

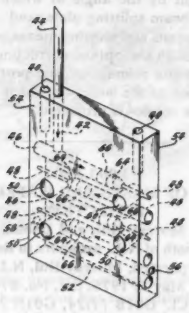
3,963,355
PROCESS AND APPARATUS FOR ANALYZING SPECIMENS FOR THE PRESENCE OF MICROORGANISMS THEREIN

Clifton Aldridge, Jr., Creve Coeur; Paul W. Jones, St. Charles; Sandra F. Gibson, St. Ann; Richard D. Vannest, St. Charles; James T. Holen, Florissant; George F. Keyser, St. Louis, all of Mo., and Michael C. Meyer, Belleville, Ill., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation of Ser. No. 255,533, May 22, 1972, abandoned.
This application Apr. 16, 1974, Ser. No. 461,249
Int. Cl.[2] G01N *21/06*, *1/00*
U.S. Cl. 356—201 **36 Claims**

1. A device for detecting the presence of at least one specific microorganism in a specimen, said device comprising: receptacle means for containing a diluted specimen, a flow channel leading from the receptacle means, at least one selective culture medium in the flow channel whereby the diluted specimen will mix with the culture medium to form a diluent mixture, the culture medium being capable of sustaining a specific microorganism in the diluent mixture such that the

continued existence of said living specific microorganism will change the light transmitting characteristics of the diluent



mixture so as to indicate the presence of the specific microorganism in the specimen.

3,963,356

OPTICAL SIGHT

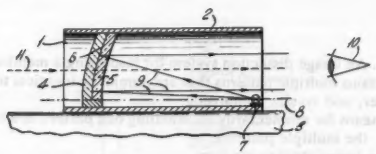
Klas Rudolf Wiklund, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Dec. 5, 1974, Ser. No. 529,920

Claims priority, application Sweden, Dec. 11, 1973, 7316669

Int. Cl.² G02B 27/34

U.S. Cl. 356—251 6 Claims



1. An optical sight including a light source and a semi-transparent lens system wherein the lens system gives an image of the light source, serving as an aiming point, said lens system having a reflecting surface for reflection of said image in the direction of a pointer's eye, and means for periodically changing the luminance of the image of the light source with a frequency within the perceptibility range of the eye.

3,963,357

APPLICATOR DEVICE

David John Crisp, London, England, assignor to Beecham Group Limited, Great Britain

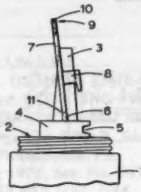
Filed July 25, 1974, Ser. No. 491,879

Claims priority, application United Kingdom, Aug. 2, 1973, 36864/73

Int. Cl.³ A46B 11/02

U.S. Cl. 401—191 8 Claims

1. An applicator for viscous fluids such as adhesives which comprises a reservoir body for holding the viscous fluid one end of which is closed and the other end of which has a top portion, an elongated discharge nozzle connected to the top portion, which nozzle communicates with the interior of the reservoir body, a collar having a recess at one portion fitted around the base of the nozzle, a spreading member pivotably mounted on the collar, the spreading member being mounted such that it is movable between an operative position adjacent the discharge nozzle and an inoperative position substantially normal to the long axis of the discharge nozzle, and means for clamping the spreading member to the nozzle in the operative



position and for clamping the spreading member to the recess in the collar in a snap-lock relationship.

3,963,358

PAPER DISPENSING PEN

Roy W. Houser, 4060 Mount Brundage Ave., San Diego, Calif. 92111

Filed Feb. 12, 1975, Ser. No. 549,161

Int. Cl.² B43K 29/12, 29/20

U.S. Cl. 401—195 12 Claims

1. A paper dispensing assembly comprising:

a. generally cylindrical sheath substantially defining an enclosure and having a longitudinal slot therein;

b. a generally cylindrical hollow cartridge longitudinally extended within said sheath, said cartridge being self-contained and removable from said sheath and having a longitudinal slot therein to permit the passageway therethrough of paper from a roll contained with the cartridge;

c. said cartridge being spaced from at least a portion of said sheath adjacent to slot therein to define a space for a projecting end of paper extending through the slot in said cartridge;

d. means permitting the limited rotation of said cartridge relative to said sheath;

e. control means operatively connected to said cartridge and accessible from externally of said sheath for rotating said cartridge, whereby the free end of a roll of paper contained within the cartridge and threaded through the slot therein can be positively driven through or retracted from the slot in said sheath by operating said control means to rotate said cartridge.

3,963,359

PROTECTIVE SCREW CAP FOR THE WRITING POINT OF A TUBE WRITING PEN

Gerold Anderka, Ellerbek, Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Sept. 30, 1975, Ser. No. 618,179

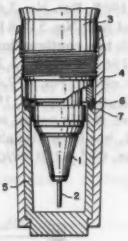
Claims priority, application Germany, Feb. 25, 1975, 7505779[U]

Int. Cl.² B43K 9/00, 1/00

U.S. Cl. 401—258 8 Claims

1. In a receptacle or protective cap for the writing point of a tube writing pen, the pen comprising a writing cone provided with a writing tube and fitted into a sleeve, there being an ink equalization chamber in the annular space between the cone and the sleeve, wherein the cap itself comprises of an open-ended hollow body adapted to be secured over the sleeve by its open end, the other end of said cap being closed, and wherein the improvement comprises a rigid base within said cap, and further comprising an inner annular sealing face for

axially engaging against an annular projecting end of the sleeve when the cap is secured over the sleeve, said sealing



face further comprising an annular layer of soft resilient material axially supported by an annular surface of said rigid base.

3,963,360

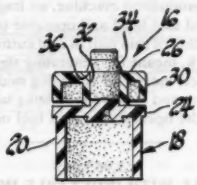
CAM LOCK AND METHOD FOR MAKING SAME

A. Fred Fedrigo, 35750 Industrial Road, Livonia, Mich. 48150

Division of Ser. No. 492,190, July 26, 1974, Pat. No. 3,897,621. This application May 27, 1975, Ser. No. 580,582

Int. Cl.² F16B 7/14

U.S. Cl. 403—14 **1 Claim**



1. A telescopic pole assembly, comprising:

an elongated first hollow pole of a first diameter and an elongated, second pole of a lesser, second diameter, the second pole being receivable in the first pole;

a spindle mounted on the end of the second pole, and having a cylindrical sidewall disposed on an axis parallel to but spaced from the longitudinal axis of the second pole;

an annular shoulder integrally carried on the spindle in a position between the end thereof and the second pole to define a first spindle portion having a cylindrical sidewall and a second spindle portion having a cylindrical sidewall, the shoulder having a wall tapered from a first shoulder diameter adjacent the second spindle portion toward a lesser diameter adjacent the first spindle portion; and

a cam adapted to be rotatably mounted on the spindle and to be receivable in the first pole, the cam having a thickness accommodating the space between the annular shoulder and the second pole, the cam having a spindle-receiving opening with a diameter less than that of the annular shoulder but greater than the first spindle portion such that the cam is adapted to be mounted on the spindle by having the first spindle portion disposed in the spindle-receiving opening and then moving the second pole toward the cam to pass it over the shoulder to a position on the second spindle portion,

whereby the cam is operative to be wedged within the first pole at such times as it is longitudinally twisted with respect to the second pole.

3,963,361

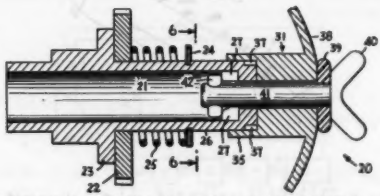
SHAFT ATTACHMENT ASSEMBLY

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed June 18, 1974, Ser. No. 480,530

Int. Cl.² F16D 1/06; B60B 37/00

U.S. Cl. 403—255 **6 Claims**



3. A shaft attachment assembly for fastening a member to a shaft comprising:

an elongated shaft having a receptacle end with an axial end opening therein and a stud receiving surface formed integrally therein to provide a one-piece shaft and receptacle;

a stud for engagement with the receptacle end and having a body portion and a head portion;

one of the receptacle end including the stud receiving surface and the body portion having surfaces forming a tapered cam surface terminating in a locking detent and the other of the receptacle end including the stud receiving surface and the body portion having a transverse pin extending laterally therefrom;

the member to be fastened to the shaft having an axial passageway therethrough positioned so that when the member is aligned with the receptacle end of the shaft, the passageway in the member will be aligned with the opening in the shaft;

the body portion of the stud being extendable through the passageway in the member and the opening in the shaft to bring the pin into rotatable engagement with the cam surface;

a resilient tension element on said assembly to permit relative axial movement as the stud is rotated and the pin follows the cam surface to the locking detent thereby rigidly fastening the member to the stud and to permit relative axial movement as the stud is rotated and the pin follows the cam slot from the locking detent to a disengaged position where the stud can be removed and the member and shaft disengaged; and

the member having a downwardly extending skirt adapted to surround the outer surface of the receptacle end portion of the shaft so as to facilitate alignment of the member and the shaft for fastening purposes.

3,963,362

ROAD MARKER

Jack L. Hollis, Mechanicsburg, Pa., assignor to Carlisle Corporation, Carlisle, Pa.

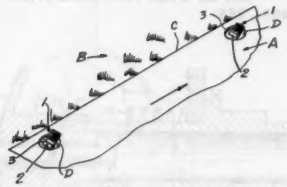
Filed Nov. 27, 1974, Ser. No. 527,873

Int. Cl.² E01F 9/00; G02B 5/132

U.S. Cl. 404—10 **6 Claims**

1. A road with light reflective markers comprising a road having at least one hole in the surface thereof, a resilient roadmarker having a hole extending therethrough from one face to an opposite face of said roadmarker, at least one light reflective member mounted on one of said faces of said roadmarker, said roadmarker being partially positioned in said road hole with said light reflective material extending above the road surface, a solid plug being seated on one of said faces of said roadmarker in said road hole and covering the opening

of said roadmarker hole on said one of said faces and retaining means filling said road hole, said roadmarker hole from the



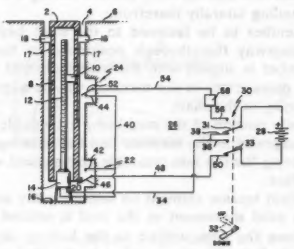
other of said roadmarker faces and extending along said roadmarker and plug portions in said road hole.

3,963,363

TRAFFIC CONTROL DEVICE

David H. Roper, 1732 Hill St., Santa Monica, Calif. 90405

Filed Mar. 4, 1974, Ser. No. 447,929
Int. Cl.² E01F 9/00
U.S. Cl. 404—11 5 Claims



2. A traffic control device retractable into an opening in a roadway comprising:

resilient deformable hollow marker means having a longitudinal axis generally orthogonal to the plane of the roadway surface and disposed in said opening for movement in and out of said opening;

rotary motor power means having an output shaft and mounted in said opening;

rotary actuator means connected to the output shaft of said power means for rotation therewith, said actuator means comprising a cylindrical screw means having a longitudinal axis, said screw means being arranged in the hollow interior of said marker means such that its longitudinal axis is generally coincident with the longitudinal axis of said marker means and rotated by said power means; follower means attached to said marker means and in engagement with the threads on said screw means whereby rotation of said screw means causes said marker means to move into and out of the opening; and

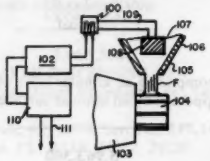
control means operatively related to said motor power means for controlling said power means.

3,963,364

TOOL CONTROL SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 182,501, Sept. 21, 1971, Pat. No. 3,817,647, which is a continuation-in-part of Ser. No. 775,433, Nov. 13, 1968, Pat. No. 3,605,909, which is a continuation-in-part of Ser. No. 518,616, Jan. 4, 1966, Pat. No. 3,476,481, which is a continuation-in-part of Ser. No. 294,076, July 10, 1963, Pat. No. 3,226,833, which is a continuation-in-part of Ser. No. 477,467, Dec. 24, 1954, abandoned. This application June 14, 1974, Ser. No. 479,515
The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.
Int. Cl.² B23B 49/00
U.S. Cl. 408—8 10 Claims



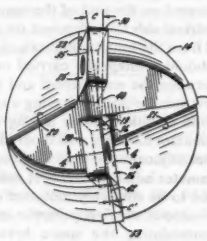
7. An automatic production machine for performing preprogrammed operations on work comprising in combination with a tool head and a spindle rotatably supported by said tool head, a cutting tool supported by said spindle and means for power rotating said spindle to permit said cutting tool to machine work which is predeterminately positioned with respect to said production machine, an inspection transducer supported by said tool head and operable to detect variations in the configuration of said tool as said cutting tool rotates and operates on work, means for generating signals on the output of said transducer, means for receiving said signals generated by said transducer and means for utilizing said received signals for controlling the operation of said tool on said work.

3,963,365

DRILL WITH INDEXABLE INSERTS

Fred T. Shallenberger, Jr., Caledonia, Ill., assignor to Metal Cutting Tools, Inc., Rockford, Ill.

Filed May 7, 1975, Ser. No. 575,334
Int. Cl.² B23B 51/00
U.S. Cl. 408—186 6 Claims



1. A drill comprising an elongated and generally cylindrical body adapted to be rotated in a predetermined direction about its own axis and having a shank end and a tip end, first and second angularly spaced grooves formed in said body and opening out of the tip end thereof, first and second recesses at the tip end portions of the respective grooves, first and second indexable cutting inserts seated in the respective recesses and releasably secured to said body, said first recess locating said first insert such that the active cutting edge of said first insert extends outwardly from the center of said body

toward the peripheral surface thereof and is disposed at a positive radial angle, said second recess locating said second insert such that the active cutting edge of said second insert extends inwardly from the peripheral surface of said body toward the center thereof and is disposed at a negative radial angle, the active cutting edge of said first insert being inclined so as to progress away from the shank end of said body as such cutting edge progresses outwardly from the center of said body, the active cutting edge of said second insert being inclined so as to progress away from the shank end of said body as such cutting edge progresses inwardly from the peripheral surface of said body, and the radially outermost point of the active cutting edge of said first insert projecting axially beyond the tip end of said body by a greater distance than the radially innermost point of the active cutting edge of said second insert.

3,963,366
BORING TOOL FOR WORKING BORES OF SMALL DIAMETER

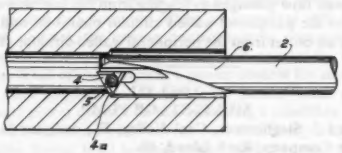
Otto Eckle, Lochgau, and Hans Grzegorz, Besigheim, both of Germany, assignors to KOMET Stahlhalter-und Werkzeugfabrik, Robert Breuning GmbH, Besigheim, Germany

Filed Oct. 17, 1974, Ser. No. 515,670

Claims priority, application Germany, Oct. 29, 1973, 7338797[U]

Int. Cl.² B23B 51/00

U.S. Cl. 408—199 **15 Claims**



1. A boring tool for working a bore of small diameter in a workpiece comprising:

a shaft of circular cross-section having a clamping part for supporting the tool and a neck part extending from the clamping part and terminating in a foward end;

a cutting plate having cutting points, said cutting plate being completely within the cross-section of said neck part except for minimal projection of a single said cutting point sideways beyond the periphery of said neck part, and means eccentrically locating and removably affixing said cutting plate in snugly recessed relation in said forward end of said neck part for interchanging of cutting plates and replacing of a used cutting point with another cutting point by reorientation of said cutting plate;

a semicircular cross-section cuttings channel in the peripheral surface of said neck part, said cuttings channel opening forwardly of the neck part at and in communication with said cutting plate, said cuttings channel extending rearwardly toward said clamping part and being spiralled in the direction of rotation and feed of the workpiece with respect to the boring tool, the spiralling of said cuttings channel approaching, at maximum, one-third of a pitch, the surface of the cuttings channel being smoothly ground, the angle of pitch (α) of said cuttings channel being about 70° to 80°, the boring tool having only a single cutting plate, the only structure protecting laterally from said neck part to contact the wall of the bore being said single cutting point of said cutting plate, said neck part having only a single said cuttings channel and having, intermediate the ends of said cuttings channel, a cross-section generally of half-moon shape.

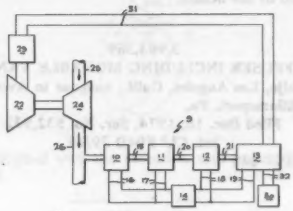
3,963,367
TURBINE SURGE DETECTION SYSTEM

Robert W. Stalker, and Bernard Blutinger, both of San Diego, Calif., assignors to International Harvester Company, San Diego, Calif.

Filed Aug. 21, 1974, Ser. No. 499,353

Int. Cl.² F04D 15/02

U.S. Cl. 415—17 **10 Claims**



1. A gas compressor surge detector system, comprising:

compressor discharge pressure sensing means for connection to a compressor output line for produceing a signal responsive to the magnitude of said discharge pressure;

signal detecting means coupled to said pressure sensing means for producing an electrical output pulse when the magnitude of said signal exceeds a predetermined value;

pulse counting means coupled to said signal detecting means for counting the pulse rate and for producing an output signal in response to receiving a predetermined number of pulses within a given period of time from said signal detecting means; and

signal utilization means coupled to said pulse counting means for emitting a control signal in response to the output signal from said pulse counting means.

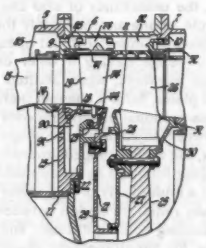
3,963,368
TURBINE COOLING

Calvin W. Emmerson, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1967, Ser. No. 691,834

Int. Cl.² F01D 5/14

U.S. Cl. 415—115 **7 Claims**



1. A gas turbine comprising, in combination, means for supplying a hot motive fluid under pressure, means for supplying a cooling fluid at a supply pressure substantially the same as the pressure of the motive fluid, a turbine nozzle including an outer shroud and an inner shroud defining between them a path for the said motive fluid, the nozzle including a ring of vanes extending from one shroud to the other, and means for cooling surfaces of the nozzle exposed to the motive fluid by the said cooling fluid including a facing of sheet metal of controlled perviousness to fluid defining the said surfaces having closely spaced extensively distributed pores through the facing portions so exposed; means for conducting the

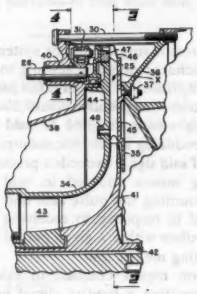
cooling fluid from the said source to the facing to flow through the facing, the conducting means including means for delivering the cooling fluid to a portion of the facing at a lower pressure below the supply pressure of the cooling fluid delivered to another portion of the facing, consonant with variations in pressure of the motive fluid exerted against diverse portions of the facing; and means for employing the drop in pressure of the fluid from the supply pressure to the lower pressure to energize cooling fluid jets for impingement cooling of a portion of the nozzle.

3,963,369

DIFFUSER INCLUDING MOVABLE VANES

Otto E. Balje, Los Angeles, Calif., assignor to Avco Corporation, Williamsport, Pa.

Filed Dec. 16, 1974, Ser. No. 532,932
Int. Cl.² F04D *29/46*
U.S. Cl. 415—148 **2 Claims**



1. An annular diffuser for use with a centrifugal compressor having a radial flow impeller whose outer periphery is closely surrounded by the inner circumference of the annular diffuser, said diffuser comprising:

a forward annular end plate;

a rear annular end plate axially spaced from said forward annular end plate;

a plurality of pivotable vanes positioned between said end plates, said vanes and said end plates defining a plurality of channels, the centerlines of said channels being tangent to a circle having approximately the same diameter as said impeller, the innermost end of each of said vanes comprising a wedge having a taper chosen such that adjacent vane members, when abutted by said forward and rear end plates, form a channel therebetween having constant cross-sectional dimensions over a length defined as being between adjacent wedge-shaped inner portions of said vanes, the wedge-shaped innermost end of each of said vanes being followed by an oppositely tapered outer end whereby a multiplicity of said vanes when assembled in substantially radial formation between said end plates form an expanding volume diffuser; and

pivoting means for simultaneously pivoting each of said vanes to vary the cross-sectional area of said channels.

3,963,370

LAUNDRY MACHINE BLOWER MECHANISM

Roy K. Yates, and Charles T. Lutes, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

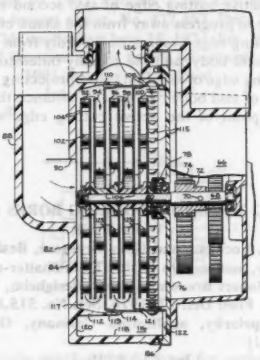
Filed Oct. 16, 1974, Ser. No. 515,160
Int. Cl.² F04D *1/02, 17/12, 29/44*
U.S. Cl. 415—199 A **5 Claims**

1. In a multi-stage chamber type blower mechanism having a plurality of bladed rotatable blower wheels in axial alignment to produce an air flow, the improvement comprising:

a. a housing surrounding the blower wheels,

b. an air inlet directed at the center of a first blower wheel,

c. a peripheral walled chamber having an interior wall and an outer wall located circumferentially around all of the lower wheels, the first stage chamber having a stationary



circumferential flange as an air flow restriction wall and the other stage chambers having rotating restriction walls,

d. an air flow passageway leading from the last blower wheel into the peripheral walled circular chamber, and

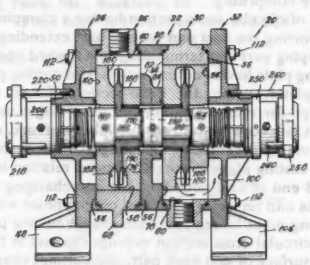
e. an air outlet from the peripheral walled circular chamber.

3,963,371

MULTI-STAGE PUMP

Leonard J. Sieghartner, Coal Valley, Ill., assignor to Roy E. Roth Company, Rock Island, Ill.

Filed July 24, 1975, Ser. No. 598,564
Int. Cl.² F04D *29/42*
U.S. Cl. 415—199 T **19 Claims**



1. A multi-stage regenerative turbine pump comprising: a casing having a plurality of successive-stage casing rings, a transfer plate in intermediate abutment with each adjacent pair of said casing rings and having fluid passageway means presenting an entrance communicating with the interior of the earlier-stage casing ring and an exit communicating with the interior of the later-stage casing ring, a suction end casing section abutting the first-stage casing ring, a discharge end casing section abutting the last-stage casing ring, and means securing the aforesaid casing elements together; a shaft extending axially through said casing; an impeller within the confines of each of said casing rings and keyed to said shaft for rotation therewith; a locating collar secured to said shaft adjacent each of said impellers; spring means biasing each of

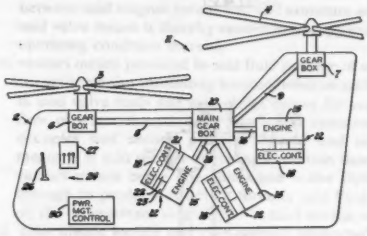
said impellers into engagement with the adjacent of said locating collars; a pair of liners arranged at the opposite sides of each of said impellers; and each associated casing ring, impeller, pair of liners, locating collar, and spring means, together comprising a module which functions as one stage of the pump.

3,963,372

HELICOPTER POWER PLANT CONTROL

Richard D. McLain; Robert E. Nelson; Bernard H. Van Sickle, and Oran A. Watts, III, all of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1975, Ser. No. 541,797
Int. Cl.² B64C *11/44*
U.S. Cl. 416—30 **3 Claims**



1. An engine control system for a helicopter having plural engines geared to a common lifting rotor system with collective pitch control, the engine control system comprising, in combination, means including a condition control for setting the power level of each engine; a power control for supplying fuel to each engine including engine power level setting means; said power control further including a condition servomotor and a collective pitch servomotor additively coupled to said engine power level setting means in the power control; means coupled to the condition control for transmitting a power level request electrical control signal decreasing with increasing power level request from the condition control to the condition servomotor; and means coupled to the collective pitch control for transmitting an electrical control signal decreasing with increasing collective pitch request from the collective pitch control to the collective pitch servomotor; the servomotors operating in such sense that said engine power level setting means increases fuel supply in response to decreasing power level request signals calling for increased power and also increases fuel supply in response to decreasing collective pitch signals indicative of increased collective pitch, with the result that a failure of transmission of either signal simulates a maximum power request with relation to that signal.

3,963,373

CONTOURED SHEET METAL AIRFOIL FANS

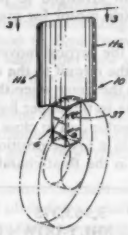
William T. Macauley, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 3, 1974, Ser. No. 485,645
Int. Cl.² F04D *29/34*
U.S. Cl. 416—214 A **7 Claims**

1. A fan blade and root assembly, comprising:

a. a sheet metal blade useful for impelling air, said blade having an axis with leading and trailing edges, said blade having a predetermined curvilinear airfoil contour transverse to the axis of said blade, and

b. a blade root having a planar web extending from said blade along said axis and disposed between the leading and trailing edges of said blade, said root having symmetrically arranged wing portions extending from leading and trailing edges of said web and folded back toward the web for substantially completing a hollow polygon spaced from said blade, said polygon having spaced securement



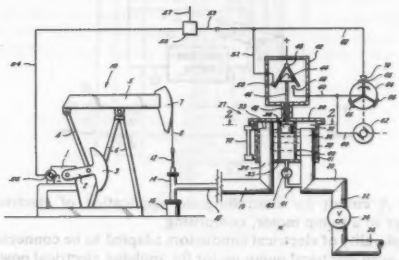
walls aligned with the direction said assembly is to be rotated.

3,963,374

WELL PUMP CONTROL

Robert E. Sullivan, 8007 Mullins, Houston, Tex. 77036

Filed Oct. 24, 1972, Ser. No. 300,129
Int. Cl.² F04B *49/00*
U.S. Cl. 417—12 **9 Claims**



1. A pump control for a pump driven by an electric motor for pumping liquid from a well through a discharge line comprising,

a float body having a float chamber,

a float in the float chamber,

an inlet line connected to and extending upwardly from the bottom of the float chamber to adjacent its top and provided with an opening directing inflow of liquid away from the float, the inlet line attachable to a first segment of the discharge line,

an outlet line connected to and extending upwardly through the bottom of the float and having an opening spaced above the bottom of the float chamber and attachable to a second segment of the discharge line downstream from the first segment whereby liquid in the discharge line is pumped through the first segment, the inlet line into the float chamber and out the outer line into the second segment of the discharge line and establishes an upper liquid level in the float chamber,

a drain line adjacent the bottom of the float arranged to drain liquid out of the float chamber and to establish a lower liquid level in the float chamber,

the float in the float chamber being disposed out of the direct flow path of fluid entering into the float chamber and arranged for vertical movement with changes in the level of liquid in the float chamber,

a float guide having openings at its lower portion extending vertically upwardly from the bottom to adjacent the top of the float chamber out of the direct flow path of fluid entering into the float chamber surrounding the float and

guiding the float in its vertical movement and shielding the float from surges of gas,

an energizing electric circuit for the electric motor,

a timer in the circuit arranged to periodically close the circuit to the electric motor for predetermined intervals of time, and

a switch actuated by the vertical movement of the float and arranged to close the circuit to the electric motor and to open the circuit to the timer when the float is in an upper position in response to the upper liquid level and to open the circuit to the motor and to close a circuit to the timer when the float is in a lower position in response to the lower liquid level in the float chamber.

3,963,375

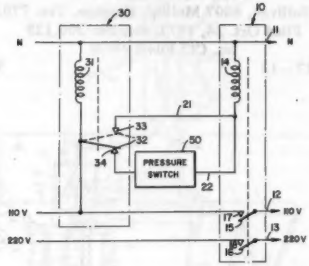
TIME DELAYED SHUT-DOWN CIRCUIT FOR RECIRCULATION PUMP

George C. Curtis, 2701 SE. 87th, Portland, Oreg. 97266

Filed Mar. 12, 1974, Ser. No. 450,300

Int. Cl.² F04B *49/00*

U.S. Cl. 417—12 **1 Claim**



1. A circuit for controlling the application of electrical power to a pump motor, comprising

a plurality of electrical conductors adapted to be connected to an electrical pump motor for applying electrical power thereto,

a first relay having a pair of cooperating contacts in at least one of said conductors for controlling the flow of current therethrough,

a second relay having a coil connected between two of said conductors, said second relay thereby being actuated upon the application of an electrical potential between said two conductors,

one end of the coil of said first relay being connected to a first of said two conductors and the other end thereof being connected to a first fixed contact of said second relay, said other end of said coil of said first relay also being connected to a second fixed contact of said second relay through a pressure-sensitive switch adapted to sense the output pressure of a pump driven by such motor, said pressure-sensitive switch being adapted to open and interrupt the connection between said first relay coil and said second fixed contact of said second relay for sensed pressures less than a predetermined minimum, and

a movable contact on said second relay connected to a second of said two conductors and contacting said first fixed contact when said second relay is first actuated, said second relay being adapted to return to a de-energized condition upon the expiration of a predetermined period of time, moving said movable contact into contact with said second fixed contact,

whereby energization of an associated pump motor is assured for a predetermined period of time irrespective of the output pressure of the associated pump, after which period of time the pump motor will be de-energized when such output pressure drops below a predetermined level.

3,963,376

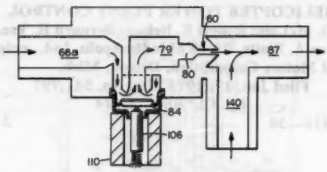
AUTOMATIC WATER POWERED SUMP DRAINER

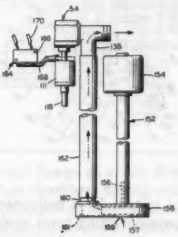
David M. Miskin, 8 Still Lane, West Hartford, Conn. 06117

Continuation-in-part of Ser. No. 487,904, July 12, 1974, abandoned. This application June 5, 1975, Ser. No. 583,953

Int. Cl.² F04F *5/48*; F04B *49/04*

U.S. Cl. 417—40 **13 Claims**





1. An automatic water powered sump drainer operable for removing water from a confined area comprising:

a. valve means supported in spaced relation adjacent to and externally of the confined area, said valve means including a valve body having a fluid passage formed therein, inlet means provided at one end of said fluid passage, outlet means provided at the other end of said fluid passage, said inlet means being connectible to an external water supply for supplying water as a power source to the sump drainer, said outlet means being adapted for connection to a drain outlet for discharging water from the sump drainer into the drain outlet, said valve means further including armature means and having an opening formed in said valve body with one end of said opening communicating with said fluid passage intermediate the ends thereof, said armature means being supported relative to said opening for movement between a first position wherein said armature means is effective to block the flow of water through said fluid passage and a second position wherein said armature means permits water to flow through said fluid passage from said inlet means to said outlet means, said valve means having a first operating condition wherein the flow path in said fluid passage through said valve means between said inlet means and said outlet means thereof is interrupted when said armature means occupies said first position thereof and a second operating condition wherein an uninterrupted flow path is established in said fluid passage through said valve means between said inlet means and said outlet means thereof when said armature means occupies said second position thereof;

b. a float assembly operatively connected to said valve means for controlling the movement of said armature means between said first and second positions thereof and thereby the movement of said valve means between said first and second operating conditions thereof, said float assembly including float means supported within the confined area for movement therewithin in response to a change in the water level within the confined area, said

float assembly further including magnet means operable for producing a magnetic field, said magnet means being operatively connected to said float means for movement therewith between a first position wherein said armature means lies outside the effective range of the magnetic field of said magnet means and a second position wherein said armature means lies within the effective range of the magnetic field of said magnet means, said float means being movable between a first position within the confined area wherein said magnet means occupies said first position thereof, said armature means occupies said first position thereof and said valve means is in said first operating condition thereof, and a second position within the confined area wherein said magnet means occupies said second position thereof, said armature means is caused to move from said first position to said second position thereof as a result of the magnetic attraction created between said magnet means and said armature means and said valve means is thereby caused to occupy said second operating condition thereof;

c. venturi means provided in said fluid passage of said valve means at a point therealong located between said opening in said valve body and said outlet means for receiving a flow of water therethrough when said armature means occupies said second position thereof and said valve means is in said second operating condition thereof, said venturi means being operable when water flows therethrough to produce a suction force in said fluid passage on the downstream side of said venturi means; and

d. tube means having one end thereof connected to said valve means and the other end thereof positioned below the level of the water in the confined area, said tube means having said one end thereof connected in fluid flow relation with said fluid passage in said valve means at a point therealong located in juxtaposed relation to the downstream side of said venturi means so as to be exposed to the suction force produced by said venturi means when water flows therethrough, said tube means being operable to draw water from the confined area therethrough by means of suction force produced by said venturi means to which said tube means is exposed and to discharge the water drawn from the confined area into said fluid passage for subsequent discharge into the drain outlet.

3,963,377

PNEUMATICALLY POWERED PUMP SYSTEM

J. Kelly Elliott, Baytown, and Robert W. Dinning, Houston, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed May 20, 1974, Ser. No. 471,277

Int. Cl.[2] F04F *1/18;* **F04B** *9/12, 43/10, 45/00*

U.S. Cl. 417—90 **25 Claims**

1. A system for moving fluid from a first place to a second place comprising:

a. a pump housing means at said first place;

b. gas pressure supply means for providing a pressurized gas;

c. supply conduit means connecting said housing means and said gas supply means for supplying pressurized gas to said housing means;

d. holding chamber means within said housing means for receiving and temporarily holding said fluid;

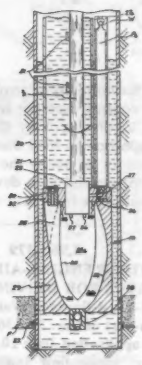
e. one-way inlet flow conduit means for ingress of said fluid into said holding chamber means;

f. one-way outlet flow conduit means for egress of said fluid out of said holding chamber means;

g. expansion chamber means within said housing means for receiving pressurized gas from said supply conduit means;

h. displacing means including a flexible bladder within said housing means disposed between said holding chamber means and said expansion chamber means and dividing the interior of said housing means into said holding chamber means and said expansion chamber means, said displacing means being responsive to force from said pressurized gas in said expansion chamber means to increase the volume of said expansion chamber means and decrease the volume of said holding chamber means thereby causing said fluid to flow from said holding chamber means through said outlet flow conduit means, said displacing means further being selectively responsive to force from said fluid in said holding chamber means to increase the volume of said holding chamber means and decrease the volume of said expansion chamber means thereby causing gas to flow from said expansion chamber means;

i. flow line means connecting said outlet flow conduit means and said second place for conducting said fluid, displaced from said holding chamber means, from said first place to said second place; and



j. subsurface control means comprising inlet control means for ingress of said pressurized gas from said supply conduit means into said expansion chamber means and outlet control means for egress of said gas out of said expansion chamber means, said control means selectively operable to permit said pressurized gas to enter said expansion chamber means through said inlet control means while preventing said gas in said expansion chamber means from leaving said expansion chamber means thereby forcing said fluid out of said holding chamber means through said outlet flow conduit means, said control means further being selectively operable to prevent said pressurized gas from entering said expansion chamber means from said supply conduit means while permitting said gas in said expansion chamber means to be forced out of said expansion chamber means through said outlet control means in response to movement of said displacing means caused by the pressure exerted by the fluid in said holding chamber means.

3,963,378

PART THROTTLE CONTROL — PUMP OVERRIDE

William D. McMillan, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 4, 1975, Ser. No. 583,366

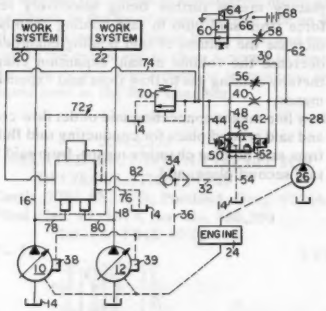
Int. Cl.[2] F04B *49/00;* **F16D** *31/02*

U.S. Cl. 417—216 **6 Claims**

1. A hydraulic system including the combination of a horsepower-controlling system for controlling the horsepower output of a plurality of variable displacement pumps driven by a single prime mover, said system comprising:

a source of pilot pressure including a fixed displacement pump driven by said prime mover for controlling displacement of said pumps in relation to the speed output of said prime mover;

underspeed control valve means responsive to a deviation from a predetermined normal operating speed of said



prime mover for normally controlling the communication of said pilot control pressure with said pump displacement means to thereby vary the displacement of said pumps in proportion to load thereon; and,

adjustable means for adjusting the response of said underspeed valve to respond to a deviation from at least another speed different from said normal operating speed.

3,963,379

CONVERTIBLE ENGINE-AIR COMPRESSOR APPARATUS FOR DRIVING A VEHICLE

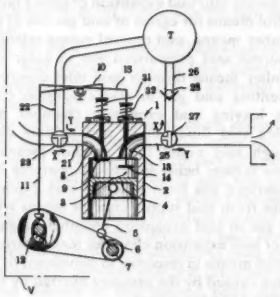
Takahiro Ueno, 5-11, 4-Bancho, Wakayama, Japan

Continuation-in-part of Ser. No. 369,119, June 11, 1973, abandoned. This application June 10, 1974, Ser. No. 477,791

Claims priority, application Japan, June 12, 1973, 48-66500; June 14, 1973, 48-67578

Int. Cl.² F04B *41/04, 7/00*

U.S. Cl. 417—237 **2 Claims**



1. A convertible engine-air compressor apparatus adapted to be mounted on a vehicle for driving said vehicle comprising a body having a plurality of compression chambers in which explosion can take place, each of said compression chamnbers being provided with an inlet opening and an exhaust opening, an inlet valve and an exhaust valve mounted in the body for each compression chamber for opening and closing the inlet and exhaust openings, a piston reciprocably mounted within each compression chamber, crank shaft means rotatably mounted in the body and connected to the pistons for reciprocating the pistons, a cam shaft rotatably mounted on the body, means connecting the cam shaft and the crank shaft means for rotating the cam shaft, an inlet cam for the inlet valve of each compression chamber and an exhaust cam for the exhaust valve of each compression chamber mounted on the cam shaft, each inlet cam having an engine action segment and a compressor action segment spaced apart from each other and a cylindrical segment positioned therebetween, each exhaust cam having an engine action segment, a compressor action segment and an air motor segment positioned therebetween, tappet means for each cam reciprocably mounted on the body for opening and closing each inlet and exhaust valve, each of said engine action segments of each cam being shaped to reciprocate the associted tappet means one during each revolution of the cam shaft, each of said compressor action segments of each cam being shaped to reciprocate the associated tappet means twice during each revolution of the cam shaft, the cylindrical segment of each inlet cam being shaped so that it does not reciprocate the associated tappet means, the air motor segment of each exhaust cam being shaped to reciprocate the associated tapper means twice during each revolution of the cam shaft, the cam shaft being mounted on the body to permit axial adjustment thereof whereby the segments of the cams can be selectively moved into engagement with the associated tappet means.

3,963,380

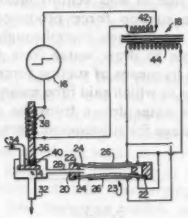
MICRO PUMP POWERED BY PIEZOELECTRIC DISK BENDERS

Lyell J. Thomas, Jr., 1900 Pelican Ave., San Pedro, Calif. 90731, and Samuel P. Bessman, 2025 Zonal Ave., Los Angeles, Calif. 90033

Filed Jan. 6, 1975, Ser. No. 538,945

Int. Cl.² F04B *17/00, 35/00, 39/08, 45/06*

U.S. Cl. 417—322 **11 Claims**



1. A pump having an inlet and an outlet comprising:

a variable volume chamber having a single port and at least one piezoelectric wall;

a single solenoid valve for controlling the communication of said port to said inlet and outlet;

a signal generator; and

a transformer having said solenoid valve and said signal generator connected in series on one side of the transformer and said piezoelectric wall connected to the other side of the transformer;

the sequentral operation of said solenoid valve and said piezoelectric wall needed to produce a pumping effect being produced by the electrical characteristics of the transformer, solenoid valve and piezoelectric wall.

3,963,381

DOUBLE FOOT VALVE FOR CRYOGENIC FLUID CONTAINING TANKS

Keith Kohnen, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 21, 1975, Ser. No. 579,524

Int. Cl.² F04B *35/04*

U.S. Cl. 417—360 **4 Claims**

1. In an apparatus for pumping fluids from a storage con-

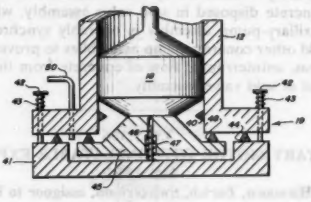
tainer and permitting removal of pumping equipment in said container without loss of fluid or pressure comprising:

a fluid transmitting casing extending from the top to the bottom portions of said storage container and communicating with said pumping equipment;

an inlet at the bottom portion defining a passage for liquid to the pumping equipment;

a fluid outlet at the upper portion of the container communicating with said transmitting casing;

a foot valve extending across said inlet for sealing the passageway to said pumping equipment from the storage container when in the closed position, and permitting fluid flow from the container to the pumping equipment and through said casing when in the open position, said foot valve including means responsive to the lifting move-



ment of the pumping equipment for closing said valve; and

a sealing gland at the top of the casing accomodating movement of the pumping equipment to permit opening of the foot valve without venting the casing;

the improvement which comprises:

a foot valve comprising an inner poppet carrying a sealing surface and extending across said inlet for sealing engagement when in a closed position; and

an outer poppet carrying a sealing surface and extending across said inlet for providing a second seal when in the closed position, said outer poppet carrying said inner poppet for independent axial movement; and

means for forcing said inner poppet and outer poppet to a closed position when said pumping equipment is raised.

3,963,382

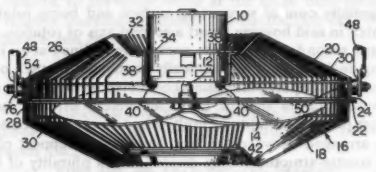
PORTABLE AIR CIRCULATING FAN

Noel Thomas Patton, 8227 Westridge Road, Fort Wayne, Ind. 46825

Filed Jan. 31, 1975, Ser. No. 546,089

Int. Cl.[3] F04B *49/10*

U.S. Cl. 417—361 **9 Claims**



1. In a fan having a rotary impeller, an electric drive motor having a shaft on which said impeller is mounted, a fan guard provided with radial members surrounding said impeller, said radial members carrying substantially the weight of the motor and impeller, said guard comprising forward and rearward sections separable along a plane substantially perpendicular to the axis of rotation of said impeller, said motor being connected to one of said sections of said guard, said support frame also being connected to one of said sections of said guard, each section of said guard having a rim at the side facing the other section, clip elements receivable over the juxtaposed rims of said sections to hold said sections together, each clip element comprising a bifurcated portion and spacer therebetween at one end to engage over said rims from the radially outer side and portion having a notch therein at the other end to engage over a radial member of at least one of the guard sections, each thus engaged radial member comprising a wire, and a support frame for said fan supportingly connected to said radial members.

3,963,383

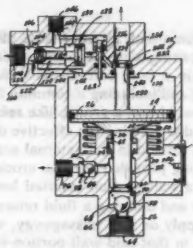
AIR DRIVEN PUMP

David C. Hill, Pasadena, Calif., assignor to Haskel Engineering & Supply Co., Burbank, Calif.

Continuation of Ser. No. 294,906, Oct. 4, 1972, abandoned, which is a division of Ser. No. 88,234, Nov. 9, 1970, abandoned, which is a continuation of Ser. No. 798,900, Feb. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 690,185, Dec. 13, 1967, Pat. No. 3,489,100. This application Aug. 13, 1974, Ser. No. 497,013

Int. Cl.[2] F01L *25/06*

U.S. Cl. 417—401 **5 Claims**



1. A fluid driven pump which includes:

a pump housing having a pump chamber therein;

a pump piston reciprocable in said pump chamber;

fluid inlet and outlet means having valving means and connected to said pump chamber for intake and output of fluid from said pump chamber;

driving piston means for reciprocating said pump piston;

driving chamber means enclosing said driving piston means;

driving fluid inlet and outlet means;

shuttle valve means movable between a first position connecting said driving fluid inlet to said driving chamber means, and a second position connecting said driving fluid outlet to said driving chamber means;

valve piston means connected to said shuttle valve means for operating the same, said valve piston means having a first surface whose effective area for moving said shuttle valve means toward said first position is larger than that of a second surface for moving said valve piston means toward said second position;

passageway means for conducting driving fluid under pressure from said fluid inlet to said first surface;

other passageway means for conducting driving fluid under pressure from said fluid inlet to said second surface;

other valve means operated by said driving piston to release pressure applied to said first surface, whereby opening of said other valve means causes movement of said valve piston means and said shuttle valve means to said second position; and

additional valve means operated by said driving piston to supply pressure to said first surface, whereby operation of said additional valve means causes movement of said valve piston means and said shuttle valve means to said first position, said other valve and said additional valve being operated to open at different times in accordance with the movement of said driving piston.

3,963,384

EROSION-PREVENTING DEVICE FOR A LIFT-AND-FORCE PUMP

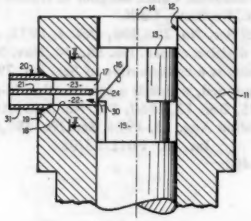
Dirk Bastenhof, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed June 27, 1975, Ser. No. 590,851

Claims priority, application France, July 16, 1974, 74.24747

Int. Cl.² F04B 7/04

U.S. Cl. 417—499 11 Claims



1. A jerk-pump with an adjustable discharge flow rate, of the kind comprising a cylindrical plunger reciprocating longitudinally within a bore formed in a barrel mounted in the pump housing and including a common feed and by-pass duct opening into said bore, a groove-like recess having a substantially helical edge defining the effective delivery stroke of said plunger being formed in the external surface of said plunger, said pump being provided with an erosion-preventing device consisting of a wall portion inserted longitudinally into said common duct and defining a fluid return or by-pass passageway and a supply or feed passageway, wherein the improvement consists in that said wall portion consists of a partition having the shape of a flat plate or strip and inserted into said common duct.

3,963,385

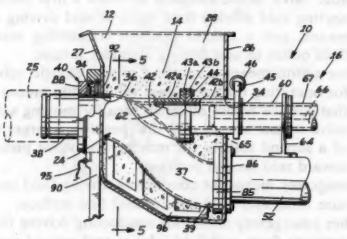
VALVE ASSEMBLY FOR CONCRETE PUMPS

Angel M. Caban, 26431 Via Gorrion, Mission Viejo, Calif. 92675

Filed May 5, 1975, Ser. No. 574,298

Int. Cl.² F04B 15/02, 7/00

U.S. Cl. 417—517 13 Claims



1. A constant, uniform-pressure-discharge, concrete-pump apparatus comprising:

a hopper for receiving a semi-fluid concrete mixture therein, said hopper being defined by a front wall having a centrally disposed opening and a plurality of inlet ports arcuately arranged about said central opening, and a rear wall having an outlet opening oppositely disposed and axially aligned with said central opening and side walls integrally formed therewith;

a valve assembly operably positioned within said hopper, said valve having a main conduit adapted with a receiving end and a discharge end, said discharge end being rotatably supported within said outlet opening in said rear wall, said receiving end thereof being movably positioned adjacent each inlet port during rotation thereof, and an auxiliary conduit integrally connected to said main conduit adjacent the discharge end thereof, the opposite end of said auxiliary conduit being rotatably supported in said central opening in said front wall, whereby said conduits form a substantially Y-shaped configuration;

a plurality of concrete-pump assemblies connected to each of said inlet ports for communication with the interior of said hopper, whereby said concrete is sequentially pumped from said hopper through said main conduit of said valve for discharge therefrom; and

an auxiliary concrete-pump assembly connected to said auxiliary conduit for operable communication with said concrete disposed in said valve assembly, whereby said auxiliary-pump assembly is operably synchronized with said other concrete pump assemblies to provide a continuous, uninterrupted flow of concrete from the discharge end of said valve assembly.

3,963,386

ROTARY MOTOR WITH INFLATABLE EXPANSION MEMBER

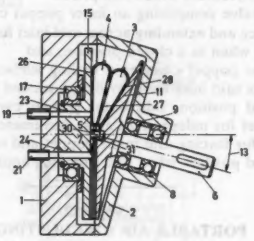
Georg Hirmann, Zurich, Switzerland, assignor to Inventa AG, Zurich, Switzerland

Filed Sept. 9, 1974, Ser. No. 504,108

Claims priority, application Switzerland, Nov. 9, 1973, 15781/73

Int. Cl.² F01C 5/00; F01B 19/00; F16J 3/00

U.S. Cl. 418—45 4 Claims



1. A motor actuated by a fluid pressure medium comprising a housing; a rotatable output drive shaft; a first support plate rotatably mounted in said housing having a supporting surface and a first axis of rotation; a second support plate having a substantially conical supporting surface and being rotatably mounted in said housing about a second axis of rotation, said first and second support plate axes being inclined at an intersecting angle and not mechanically connected to each other, said second support plate being connected to the output shaft to cause rotation thereof upon movement of said second support plate; a plurality of multi-lobed rosette shaped structures arranged between the first and second support plates, each rosette structure being divided into a plurality of independent freely distortable expansion chambers, said rosette structures being connected together and only to said first support plate in superimposed relationship between the plates; the rosette structure adjacent to the first plate being connected thereto over a relatively small area compared to the total surface area of the support plate; means providing fluid communication between adjacent chambers of the superimposed rosette structures; and pressure control means for admitting said fuid pressure medium into each expansion chamber of the rosette adjacent the first plate and the adjacent chambers of the superimposed rosettes in fluid communciation therewith sequentially to cause movement of the second support plate and rotation of the output shaft, said pressure

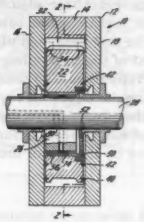
control means permitting said fluid pressure medium to be expelled from all communicating expansion chambers simultaneously after the maximum volume of the chambers has been attained.

3,963,387

ROTARY ENGINE WITH SELF-CENTERING ROTOR GEAR

Charles Jones, Hillsdale, and George H. Woodier, Ringwood, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed May 1, 1975, Ser. No. 573,448
Int. Cl.² F01C *1/02*; F04C *17/02*; F16H *55/00*
U.S. Cl. 418—61 A **7 Claims**



1. A composite rotor for use in a rotary mechanism including an outer housing having a pair of axially spaced end walls and a peripheral wall interconnecting said end walls to form a cavity therebetween and a shaft co-axial with said cavity and having an eccentric portion disposed within said cavity and upon which said rotor is to be journaled for relative rotation and for cooperation with the inner multi-lobe surface of said peripheral wall to form a plurality of working chambers between the rotor and said peripheral wall surface, said composite rotor comprising:

a. a main outer body portion having a bore extending coaxially therethrough,

b. a sleeve disposed within said bore with said sleeve being tightly secured to said rotor at all operating temperatures of said mechanism,

c. a gear co-axial with and disposed adjacent to one end face of the rotor, and

d. said gear and the adjacent end of said sleeve having cooperating splines with substantially radially engaging faces having a close fit for rotatively locating the gear relative to the rotor while at the same time permitting relative thermal expansion and contraction between the sleeve and gear.

3,963,388

UNITARY APEX SEAL ASSEMBLY

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

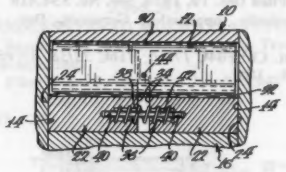
Filed Jan. 20, 1975, Ser. No. 542,532
Int. Cl.² F01C *19/10*
U.S. Cl. 418—121 **5 Claims**

1. An apex seal assembly for rotary engines comprising

a pair of spaced bolts, each adapted to engage a respective side wall of a rotor containing chamber of a rotary engine, each of said bolts having a generally radially extending slot therein, each said slot including an enlarged seal-retaining portion;

resilient means interposed between and interconnecting said bolts and adapted to urge said bolts away from each other when installed in a rotary engine into engagement with a corresponding side wall;

an apex seal received in the slots of both of said bolts, and said seal having an enlarged section within the enlarged seal-retaining portion of each of said slots; and



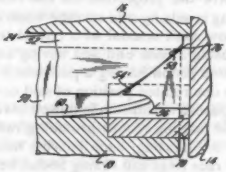
means for precluding substantial lateral relative movement between said bolts and said seal.

3,963,389

MULTI-PIECE APEX SEAL FOR A ROTARY ENGINE

George E. Miller, Libertyville, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 10, 1975, Ser. No. 566,956
Int. Cl.² F01C *19/02*
U.S. Cl. 418—121 **6 Claims**



1. A multi-piece apex seal construction for a rotary mechanism having an outer body with a cavity bounded by a peripheral wall and a pair of axially-spaced end walls and having an inner body mounted within said cavity for rotation relative to said outer body with the inner body having a plurality of apex portions for sealing cooperation with said cavity walls, said multi-piece seal construction comprising:

a. a first seal piece disposed in a groove extending axially across each apex portion of the inner body with at least one end of said first seal piece having an end face inclined to the inner and outer edges of the first seal piece such that the inner edge of said first seal piece is shorter than the outer edge;

b. a second seal piece disposed in said groove adjacent to said inclined end face of the first seal piece and having an end face for sealing engagement with the adjacent end wall of the outer body, said second seal piece also having an inclined face disposed in engagement with said inclined face of the first seal piece;

c. spring means for urging said second seal piece radially outwardly to urge its inclined face into engagement with the adjacent inclined face on the first seal piece; and

d. at least one of said inclined faces being arcuate to permit rocking movement of the second seal piece relative to the first seal piece such that the end face of the second seal piece can be flat against the adjacent end wall of the outer body.

3,963,390

BEARING ARRANGEMENT FOR ROTARY PISTON ENGINE FOR COMPRESSING AND EXPANDING GASES

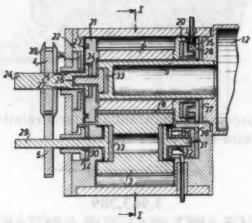
Herwig Labus, Jülich, Germany, assignor to Kernforschungsanlage Juelich Gesellschaft mit beschränkter Haftung, Juelich, Germany

Filed Dec. 19, 1974, Ser. No. 534,418

Claims priority, application Germany, Dec. 19, 1973, 2363066

Int. Cl.[2] F04C *17/10*; F16C *33/38*, *33/46*

U.S. Cl. 418—188 5 Claims



1. A bearing combination for a rotary piston engine for compressing or expanding gases and comprising; intersecting partial cups on parallel adjacent axes forming a housing, said cups being open near one region of intersection thereof, a rotary piston in each cup, said pistons having meshing labyrinth seal means and each having a radial projection which runs closely inside the pertaining cup, each piston having a pocket to receive the projection on the other piston, said projections being in side by side relation when disposed in said pockets, a hollow shaft coaxial with one piston and opening outside the housing at one end and having an axial slot, the pocket in said one piston having a port which communicates with said slot in one rotated position of said one piston, means for driving the pistons in rotation in unison in respective directions, and radial bearing means providing radial support for said pistons in the housing, each bearing means comprising inner and outer race rings and rolling bodies between said race rings and an intermediate ring between the inner and outer race rings and having recesses in which said rolling bodies are disposed, the sides of said intermediate ring which faces said outer and inner race rings comprising wedge regions which taper outwardly in both peripheral directions from near the axial planes of said rolling bodies and which approach said race rings intermediate said rolling bodies, lubricant introduced between said rings creating hydrodynamic lubricating conditions when said rings rotate relatively.

3,963,391

METHOD AND APPARATUS FOR CONTROLLING SPEED AND TORQUE OF HAND HELD AIR DRIVEN VANE TYPE MOTORS

Fred E. Thorburn, and T. Michael Thorburn, both of 13117 111th Place NE., Kirkland, Wash. 98052

Filed Nov. 21, 1974, Ser. No. 525,959

Int. Cl.[2] F04C *15/02*

U.S. Cl. 418—270 1 Claim

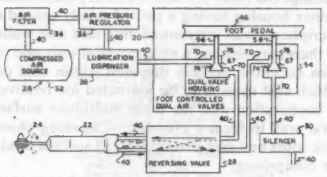
1. A foot operated control for placement on a floor and then to be actuated upon the pivotal movement of a person's foot being pivoted about a heel, to simultaneously regulate the flow of compressed air to and from a vane type air motor mounted within a handpiece for holding and driving rotatable dental laboratory tools, comprising:

a. a rectangular base for placement on the floor, having at one end spaced upstanding hinge supports, integrally derived from the said base following the formation of inwardly directed opposed partial cuts which terminate at respective ninety degree bends where these upstanding hinge supports then commence, and holes are formed at the upper terminus of each upstanding hinge support;

b. a rectangular cover for pivotal hinge attachment to the rectangular base, having at one end spaced depending hinge supports, integrally derived from the said cover following the formation of inwardly directed opposed partial cuts which terminate at respective ninety degree bends where these depending hinge supports then commence, and holes are formed at the lower terminus of each depending hinge support;

c. pivotal fastening subassemblies to join together the respective pairs of spaced upstanding and depending hinge supports which are respectively integral with the rectangular base and rectangular cover;

d. a rectangular housing having internal formed spaces for two valve assemblies and for compressed air passageways leading to and from the respective valve assemblies secured to the rectangular base adjacent the upstanding and depending hinge supports and extending only a partial distance along the said base, and of a height less than the assembled height of the upstanding and depending hinge supports, to thereby permit an unobstructed pivotal motion of the rectangular cover with respect to the rectangular base upon the pivotal movement of a person's foot being pivoted about a heel, before such movement is ultimately limited by the top of the rectangular housing;



e. a first spring positioned valve assembly installable from below within a vertical passageway of the rectangular housing, having sealing means, a compression spring, and a valve stem, which, when raised by the spring, contacts the rectangular cover to be depressed upon the pivotal movement of the said cover, said first valve stem movement interconnecting compressed air passageways respectively bringing compressed air from a compressed air source and delivering compressed air to a vane type air motor of a handpiece;

f. a second spring positioned valve assembly installable from below within a vertical passageway of the rectangular housing, having sealing means, a compression spring, and a valve stem, which, when raised by the spring contacts the rectangular cover to be depressed upon the pivotal movement of the said cover, such second valve stem movement interconnecting compressed air passageways respectively bringing compressed air from the exhaust side of a vane type air motor of a handpiece and directing it to an exhaust to atmosphere discharge opening of the said housing; and

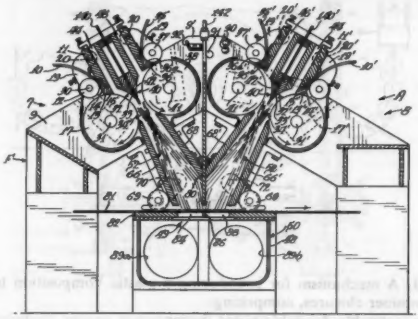
four respective projecting connectors insertable in the rectangular housing to receive respective compressed air lines bringing air to and conducting air away from the said housing, as the respective air flows are controlled by the said first and second valve assemblies.

3,963,392

APPARATUS FOR PREPARING AIR-LAID NONWOVEN WEBS FROM COMBINED STREAMS

Prashant K. Goyal, Bombay, India, assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 347,971, April 4, 1973, Pat. No. 3,895,089. This application Feb. 6, 1975, Ser. No. 547,914
Int. Cl.[2] D01G *25/00*; B29C *13/00*
U.S. Cl. 425—83 11 Claims



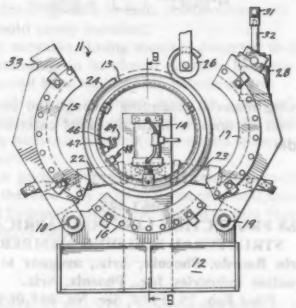
1. Web forming apparatus comprising: frame means; means for feeding a fibrous material to a first fiberizing station at a first location on said frame means; means for feeding a fibrous material to a second fiberizing station at a second location on said frame means; means defining a first mixing zone between said first and second fiberizing stations, said mixing zone having a fiber inlet end and a fiber outlet end; means adjacent the inlet end of said first mixing zone for opening said first mentioned material at said first fiberizing station and producing a supply of individualized fibers that enter said first mixing zone through said inlet end; means adjacent the inlet end of said first mixing zone for opening said second mentioned material at said second fiberizing station and producing a supply of individualized fibers that enter said first mixing zone through said inlet end; means for providing gaseous streams for initially directing said supplies of individualized fibers toward one another and to said first mixing zone; a flow controlling member; means mounting said flow controlling member for movement relative to said first mixing zone to control the extent to which said gaseous streams intermix to produce a first combined gaseous stream; means for feeding a fibrous material to a third fiberizing station at a third location on said frame means; means for feeding a fibrous material to a fourth fiberizing station at a fourth location on said frame means; means defining a second mixing zone between said third and fourth fiberizing stations, said second mixing zone having a fiber inlet end and a fiber outlet end; means adjacent the inlet end of said second mixing zone for opening said third mentioned material at said third fiberizing station and producing a supply of individualized fibers that enter said second mixing zone through its said inlet end; means adjacent the inlet end of said second mixing zone for opening said fourth mentioned material at said fourth fiberizing station and producing a supply of individualized fibers that enter said second mixing zone through its said inlet end; means for providing gaseous streams for initially directing said supplies of individualized fibers toward one another and to said second mixing zone; a second flow controlling member; means mounting said second flow controlling member for movement relative to said second mixing zone to control the extent to which said last mentioned gaseous streams intermix to produce a second combined gaseous stream means defining a third mixing zone between said first and second mixing zones and communicating with the outlet ends thereof, said third mixing zone having a fiber inlet end and a fiber outlet end; third flow controlling member; means mounting said third flow controlling member for movement relative to said third mixing zone to control the extent to which said first and second combined gaseous steams intermix to produce a third combined gaseous stream; and fiber collecting means adjacent the fiber outlet end of said third mixing zone for accumulating fibers to form a web.

3,963,393

ENDLESS TREAD MOLD APPARATUS

Carlton K. Barefoot, Muncie, Ind., assignor to Tred-X Corporation, Muncie, Ind.

Filed Dec. 18, 1974, Ser. No. 533,944
Int. Cl.[2] B29H *5/04*, *5/08*
U.S. Cl. 425—20 9 Claims



1. An apparatus for molding and curing an endless, seamless annular tire tread from a mold rubber for use in retreading of tire carcasses, comprising:

a base;

a solid center mandrel having a generally cylindrical outer surface, said mandrel forming the inside surface of a mold cavity;

a plurality of arcuate outer mold sections connected to said base and containing a tread pattern, said mold sections when together forming a circular outer mold adapted to cooperate with said center mandrel;

means connected to said base and said outer mold sections for closing said outer mold sections inwardly about said center mandrel to a closed curing position, adjacent ones of said mold sections defining at least one gap cavity when in such curing position, whereby said closing to such curing position substantially seals the resulting mold cavity from leakage of mold rubber except at all such gap cavities defined between said outer mold sections, said gap cavity forming an overflow for excess mold rubber, said closing means including means for applying a clamping force urging the outer mold sections into tight engagement circumjacent the center mandrel to apply pressure to the enclosed mold rubber; and

means for heating the mold rubber to a curing temperature, whereby thermo-expansion increases the curing pressures.

3,963,394

BLADDER FOR SHAPING PNEUMATIC TIRE

Daniel Shichman, Trumbull, Conn., and Edward P. Percarpio, N. Haledon, N.J., assignors to Uniroyal Inc., New York, N.Y.

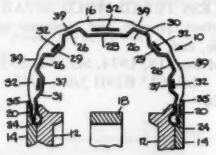
Filed June 25, 1975, Ser. No. 599,225
Int. Cl.[2] B29H *3/042*, *5/02*
U.S. Cl. 425—51 12 Claims

1. An expandable bladder for shaping a pneumatic tire, comprising

a thick, substantially cylindrical center section having a multiplicity of convolutions on the inner surface of said section, said convolutions extending perpendicular to the axis of the cylindrical section and thereby providing local

reductions in thickness and additional axial extensibility to the bladder;

a pair of annular, beaded end sections extending inwardly from each end of the cylindrical center section; and



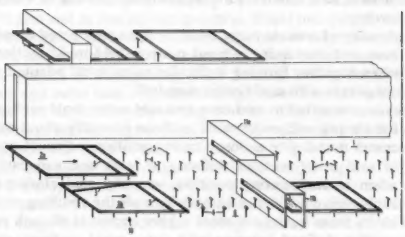
reinforcing material extending through the center section and end sections to limit the axial extensibility of the bladder.

3,963,395

MASS PRODUCTION LINE FOR FABRICATING STRUCTURAL BUILDING MEMBERS

John Lorin Bourdo, Phoenix, Ariz., assignor to Automated Construction Industries, Inc., Phoenix, Ariz.

Filed Feb. 25, 1974, Ser. No. 445,069
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—88 7 Claims



1. In a production line for fabricating structural building members in mold halves moved through a series of fabrication work stations, the combination comprising:

parallel rows of mold half supporting assemblies positioned in and between the work stations for carrying mold halves in horizontal positions with upwardly facing cavities;

each of said assemblies including roller means, and each of such assemblies supporting said roller means for rotation about an axis in the same horizontal plane as all other assembly roller means; and

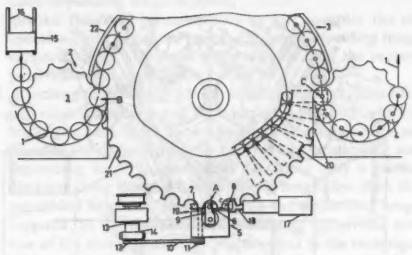
each mating mold half having, on its side opposite the cavity, a plurality of rigid, parallel upright T-shaped bars inhibiting warping of the mold half, the lower edge of each bar adapted to engage and ride on a respective row of supporting assemblies with minimum friction; and on elongated rectangular bar with a slight lower edge welded to the lower edge of each T-shaped bar parallel and level with all other rectangular bar lower edges irrespective of misalignment between T-shaped bar edge due to irregularities in the mold half.

3,963,396

CLOSURE LINING MACHINE

Keith Shotbolt, Gerrards Cross, England, and Gottfried Von Bismarck, Pully, Switzerland, assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Feb. 5, 1974, Ser. No. 439,812
Int. Cl.[2] B32B *31/00*; B29C *13/02*
U.S. Cl. 425—135 8 Claims



1. A mechanism for introducing a plastic composition to container closures, comprising:

a. rotatably driveable turret means,

b. a plurality of pellet carriers located on said turret means for movement along a closed path,

c. feed means for supplying solid pellets of plastics composition to said pellet carriers,

d. means for conveying closures around said turret means along a closed path,

e. a pellet transfer station on said turret means, and

f. means at said transfer station for transferring pellets from said pellet carriers into said closures; said closure path and said carrier closed path lying directly above one another at said pellet transfer station, wherein said means for supplying solid pellets to the carriers comprise means for advancing a continuous rod in stepwise manner, means for guiding the leading end of the rod to said carrier closed path, means on said carrier for receiving the advanced leading end of the rod, means adjacent said carrier closed path to sever the leading end of the rod from the remainder of the rod as it enters a passing carrier, and including a sensing unit to detect the absence of a closure on said closure feed means, and means responsive to sad sensing unit for disenabling said rod advancing means when the absence of a closure is detected by said sensing unit.

3,963,397

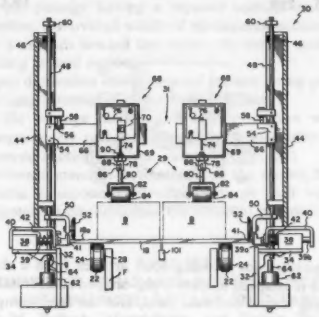
CEMENTITIOUS PRODUCT MAKING SYSTEM WITH PRODUCT HEIGHT GAUGING MECHANISM

Harry F. Cruzen, and Robert W. Gresham, both of Alpena, Mich., assignors to Besser Company, Alpena, Mich.

Filed June 3, 1974, Ser. No. 475,757
Int. Cl.[2] B28B *17/00*
U.S. Cl. 425—141 9 Claims

1. In an improved cementitious product making system having a frame means; a product forming mold mounted thereon at a mold station and having a mold cavity for receiving cementitious material; mechanism mounted by the frame means operably connected to pack material in the mold when cementitious material is supplied thereto, to aid in formation of a product in the mold cavity; product receiving means carried by the frame system for receiving a newly formed product made in the mold and comprising a transfer means and a support surface upon which the product is carried for downstream movement from the molding station; mechanism on the frame system for relatively moving the mold and at least a portion of the product receiving means to release the product from the mold; the improvement comprising: a car-

rier; means supporting the carrier for vertical movement on the frame means toward and away from the product receiving means; upper and lower sensors, the lower sensor being mounted vertically at the lower end of the carrier at a location to locate on the upper level of the support suface; the upper sensor being supported for vertical movement on the carrier at a location to sense the level of the upper surface of the



product; means moving said carrier vertically to move the sensors away from sensing position; gauging mechanism reacting to movement of the upper sensor vertically relative to the lower sensor when the sensors are in sensing position; and a control circuit mechanism connected to the gauging mechanism to respond to the magnitude of such relative vertical movement.

3,963,398

INJECTION BLOW MOLDING APPARATUS FOR HOLLOW ARTICLE HAVING OPENINGS AT BOTH ENDS

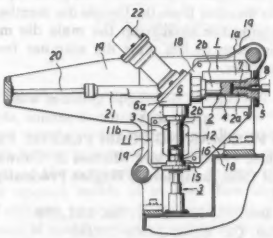
Katashi Aoki, Sakaki, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Sakaki, Japan

Division of Ser. No. 420,231, Nov. 29, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,886

Claims priority, application Japan, Dec. 4, 1972, 47-121385

Int. Cl.[2] B29D *23/02, 23/03*

U.S. Cl. 425—242 B **3 Claims**



1. Molding apparatus for forming a hollow article having openings at both ends, said apparatus comprising:

a frame;

an injection mold mounted to said frame and having a first axis, said injection mold comprising:

a first injection mold cavity member mounted on said frame;

a second injection mold cavity member mounted on said frame in confronting face-to-face relationship with said first injection cavity mold member;

a stationary core member mounted to said frame and extending between said first and second injection mold members; and

a movable core member axially aligned with said stationary core member and being axially displaceable with respect thereto, said movable core member, in a first position, extending between said first and second injection mold members and being axially withdrawable therefrom;

hydraulic means mounted to said frame;

motive means mounted to said hydraulic means, said movable core member being mounted to said motive means for axial movement by means of said hydraulic means and spatial shifting by means of said motive means; and

a blow mold mounted to said frame spaced from said injection mold, said blow mold having a second axis and comprising:

a first blow mold cavity member mounted on said frame;

a second blow mold cavity member mounted on said frame in confronting face-to-face relationship with said first blow mold cavity member;

an axially movable closing member mounted to said frame and extending, in its closed position, between said first and second blow mold cavity members; and

said movable core member, when in a second position, being axially aligned with said closing member and extending between said first and second blow mold cavity members;

wherein a parison formed in said injection mold is withdrawn therefrom by axial movement of said movable core by said hydraulic means and shifted to said blow mold by said motive means.

3,963,399

INJECTION-BLOW MOLDING APPARATUS WITH PARISON HEAT REDISTRIBUTION MEANS

Fred J. Zavasnik, Bolingbrook, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 201,823, Nov. 24, 1971. This application June 25, 1973, Ser. No. 373,358

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—242 B **2 Claims**

1. Apparatus for forming a biaxially oriented container comprising:

a. support means carrying an injection and expansion mold, said molds being opposite one another, said injection and expansion molds having fluid passages therein for circulating fluid to cool the exterior walls of a parison formed in said mold to a first temperature, and

b. core support means operatively associated with said support means carrying at least four cores radially extending from the support means at 90° intervals and for indexing said cores sequentially to the injection mold, a delay position, the expansion mold and to an ejection station, said cores having fluid passages therein for circulating fluid to cool the interior walls of said parison to a second temperature higher than the first temperature.

3,963,400

APPARATUS AND INSTALLATION FOR POURING PLATES OF ORIENTED WOOD PARTICLES

Urman Alexandrov Urmanov, Sofia, Bulgaria, assignor to DSO "Stara Planina", Sofia, Bulgaria

Filed Jan. 4, 1974, Ser. No. 430,909

Claims priority, application Bulgaria, Apr. 25, 1973, 23438

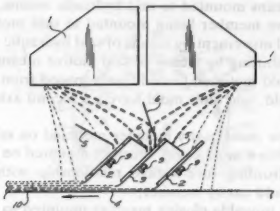
Int. Cl.[2] B29D *7/00*

U.S. Cl. 425—224 **2 Claims**

1. In an apparatus for orienting particles and depositing same upon a receiving surface in respective layers, wherein a particle separating device produces streams of different-size particles, the improvement which comprises:

a plurality of orienting plates each inclined at an angle to said surface and spaced apart to deposit said particles in respective layers upon said surface without free fall, each of said plates being formed with a base extending downwardly toward said surface, and a plurality of upwardly

open and downwardly converging chutes mounted on said base but terminating short of the lower end thereof;



means for vibrating said plates; and

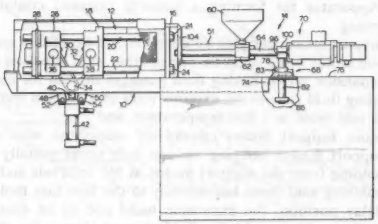
deflecting means for directing selected streams from said device onto selected ones of said plates whereby said plates deposit the respective layers with particles of different particle sizes.

3,963,401

INJECTION MOULDING MACHINE

Geoffrey Latter, Mississauga, Canada, assignor to A. C. Hamilton & Co., Mississauga, Canada

Filed June 5, 1975, Ser. No. 584,091
Int. Cl.² B29F *1/00*
U.S. Cl. 425—242 R **3 Claims**



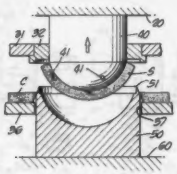
1. An improved injection moulding machine comprising, in combination, a supporting frame, a mould clamping assembly having a fixed platen mounted on said frame, an injection assembly having an injector and an injection cylinder, support means for vertically raising and lowering said injection assembly relative to said mould clamping assembly whereby the mould clamping assembly is maintained in parallel horizontal alignment with the injection assembly, said support means comprising a pair of parallel spaced tie bars, a pair of spaced vertical slots formed in proximity to each side of said fixed platen adapted to receive one end of said pair of tie bars, means for securing said ends of the pair of tie bars within said slots, a cross head for supporting the said injector mounted for slidable travel on said tie bars, a pair of vertical support rods adapted for vertical adjustment on said support frame and having connecting means securing said tie bars to the upper ends of said support rods substantially at the centre of gravity of said injection assembly, and means for raising and lowering said vertical rods in unison for adjusting the height of said injection assembly supported thereby.

3,963,402

METHOD AND APPARATUS FOR MAKING SHAPED SHELLS FOR HORS D'OEUVRES, SNACKS AND THE LIKE, AND FOOD ARTICLES PREPARED THEREBY

Peter Berta, Downey, Calif., assignor to Fairmont Foods Company, Culver City, Calif.

Filed Apr. 1, 1974, Ser. No. 456,467
Int. Cl.² A21C *11/10*
U.S. Cl. 425—299 **19 Claims**



1. An apparatus for molding food articles from a sheet of dough which is adapted to form a cup-shaped shell suitable for use in making hors d'oeuvres, tarts, and the like, comprising in combination:

a male die member;

a female die member positioned below the male die member with at least one of the male and female die members being adapted to be moved along an axis relatively toward and away from the other;

means for cutting the sheet of dough;

means for moving the die members relatively toward each other for nesting the male die member in the female die member in a forming operation for shaping the cut dough into a cup-shaped shell and for moving the die members relatively away from each other for separating the male die members from the female die member after the forming operation;

means for providing thermal energy to at least one of the die members for heating the shell during the forming operation;

a plurality of pin members spaced apart from each other on the surface of the male die member, with at least one of the pin members being positioned at an acute angle with respect to the axis of movement of the dies, for removing the shell with the male die member during the separation of the male die member from the female die member; and

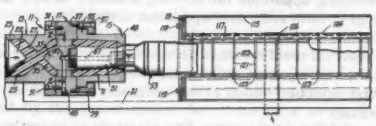
means for removing the shell from the male die member after the separation of the male die member from the female die member.

3,963,403

APPARATUS FOR MAKING FOAM PLASTIC PIPE

Roderick E. Hughes, Fullerton, and Michael J. Conway, Bakersfield, both of Calif., assignors to Hughes Processing, Inc., Anaheim, Calif.

Filed Dec. 13, 1974, Ser. No. 532,598
Int. Cl.² B29D *23/04*, *27/00*
U.S. Cl. 425—325 **14 Claims**



1. Extrusion equipment useable for making foam plastic pipe comprising:

a bushing having an internal surface defining a passage extending therethrough;

an internal mandrel at least partially within the passage of the bushing, said internal mandrel having an external surface which is spaced from said internal surface to define a die passage which circumscribes the internal mandrel;

said die passage having an inlet which is adapted to receive cellular plastic compound and an outlet through which the cellular plastic compound can be extruded;

said die passage having a tapered section and an outlet section, the overall width of the tapered section reducing as it extends toward the outlet, the outlet section terminating in said outlet;

the gap dimension of the tapered section being greater than the gap dimension of the outlet section;

said die passage having a transition section which is of progressively reducing thickness to smoothly blend the tapered section and the outlet section; and

an external mandrel downstream of the outlet, the cellular plastic compound extruded through said outlet being adapted to circumscribe the external mandrel.

3,963,404

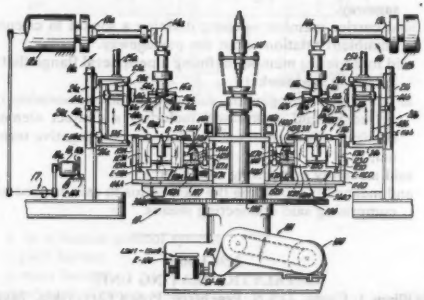
METHOD AND APPARATUS FOR MULTIPLE BLOW MOLDING WITH ROTARY TURNTABLE

Donald M. Pollock, Morristown, and Fulton W. Hallowell, Rumson, both of N.J., assignors to Consupak, Inc., Morristown, N.J.

Division of Ser. No. 368,249, June 8, 1973, Pat. No. 3,854,855. This application July 17, 1974, Ser. No. 489,186

Int. Cl.² B29D *23/03*

U.S. Cl. 425—326 B **10 Claims**



1. A blow molding apparatus comprising a rotary indexing turntable, means to rotatably index the turntable to a predetermined number of circumferentially spaced stations, said turntable having at least one partible mold mounted therewith for each of the circumferentially spaced stations, means to provide opened molds at at least first and second of said spaced stations, means to form a first parison to be operatively positioned at said first station and to form a second parison to be operatively positioned at said second station circumferentially spaced from said first station, means to position said first parison and means to position said second parison between the parted sections of each of the respective molds at the respective first and second stations, means to close said opened molds on said positioned parisons at the respective first and second stations, said each of said means to close said partible molds comprises switch means mounted on said apparatus so as to be actuated by the positioning movement of said positioning means, said switch means in turn actuating means interconnecting parted sections of the opened mold so as to close the mold along a line coincident with the axis of the positioned parison, means to introduce air under pressure to the interior of each of the respective parisons to expand the parisons to conform to the interior of the respective molds so as to form hollow object therein, means to cool each of said objects during rotation of the turntable and circumferential transfer of the molds from at least said respective first and second stations, and means for removing the formed objects from the opened molds at at least said first and second stations so as to permit other parisons to be positioned therebetween.

3,963,405

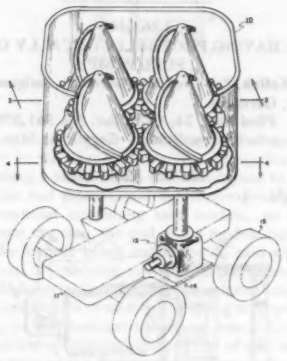
HAY CUBING ASSEMBLY

Glen E. Osborn, Star Rte. Box 265, Moses Lake, Wash. 98837

Continuation-in-part of Ser. No. 230,218, Feb. 29, 1973, Pat. No. 3,859,026. This application Sept. 26, 1974, Ser. No. 509,388

Int. Cl.² A01D *39/00*

U.S. Cl. 425—331 **4 Claims**



1. A hay cubing apparatus, comprising:

a chassis, said chassis having a substantially horizontally oriented table; said table having sidewalls issuing upwardly; and

at least a pair of dies mounted adjacent to said table on shafts, each of said dies including a rim, being fastened to said shafts, said dies including a plurality of teeth mounted distally and radially about said rim, said dies meshing with each other at their outer circumference, means driving at least one of said shafts; and

a feed cone material handling means, comprising: an upstanding cone-shaped body, said body being mounted on the operating side of each of said dies; and an auger, being a band projecting from the exterior walls of said cone-shaped body, and projecting in a spiral pattern from the apex to the base of said cone-shaped body.

3,963,406

SPINNERET ASSEMBLY FOR MULTIFILAMENT YARNS

Joseph Robert Reker, Chattanooga, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

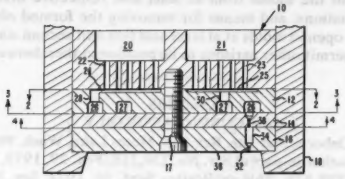
Filed June 20, 1975, Ser. No. 588,843

Int. Cl.² D01D *3/00*

U.S. Cl. 425—463 **2 Claims**

1. A spinneret assembly comprising sandwiched filter block, distribution plate, meter plate and spinneret plate elements, said filter block, said meter plate and said spinneret plate elements having spaced axially aligned flow passages, said distribution plate being provided with a pair of collection chambers in its upper surface and two concentric annular channels in its lower surface, each one of said pair being in communication with a different one of said concentric annular channels, said chambers and said channels defining separate flow paths between the filter block and the meter and spinneret plate passages; said collection chambers having a resistance to melt flow characterized by a flow resistance ratio R

of at least 0.33 wherein $P = \Delta P_2/\Delta P_1$ and ΔP_1 is the pressure drop through a set of flow passages in a meter plate and spinneret plate and ΔP_2 is the maximum pressure drop measurable along either collection chamber.



3,963,407

BURNER HAVING PHOTOELECTRICALLY OPERATED FUEL PUMP

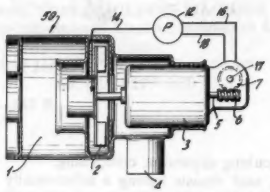
Siegfried Kofink, Zell (Neckar), Germany, assignor to J. Eberspacher, Germany

Filed Mar. 24, 1975, Ser. No. 561,370

Claims priority, application Germany, Mar. 28, 1974, 2415012

Int. Cl.² F23C *3/02*

U.S. Cl. 431—1 **3 Claims**



1. A burner, comprising means defining a combustion space, combustion air inlet means connected to said combustion space, a blower associated with said inlet means, a drive motor connected to said blower to rotate said blower and having a blower shaft, a rotatable perforated timing member connected to said blower shaft for rotation thereby in timed relationship to said blower shaft, an electromagnetic fuel pump having a fuel discharge connected to said combustion space and having an electromagnet which is energized periodically to operate said pump, an electric supply circuit connected to said electromagnet, and a photocell switch in said electric supply circuit including a photodiode arranged on one side of said perforated timing member and a photovoltaic cell on the opposite side aligned with said photodiode and positioned to receive the rays from said photodiode through the perforations of said timing member intermittently during the rotation of said timing member and to intermittently operate said pump thereby.

3,963,408

PRECOMBUSTION CONDITIONING DEVICE FOR INTERNAL COMBUSTION ENGINES

Charles A. Youngberg, Prairie View, Ill., assignor to F. D. Farnum Co., Lyons, Ill.

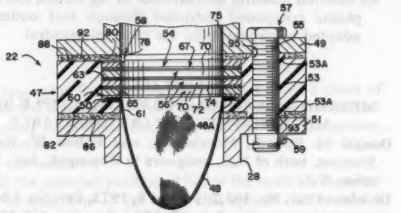
Continuation-in-part of Ser. No. 468,090, May 8, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 570,075

Int. Cl.² F23B *7/00*

U.S. Cl. 431—2 **28 Claims**

1. In a precombustion conditioning device for interposition between the carburetor and the fuel-iar inlet of a thermal combustion engine employing a vaporizable liquid fuel, said device including means for electric contact charging the liquid fuel particles of the fuel-air mixture including an electrically conductive foraminous member supported by electrically insulating means in and across the passageway from the carburetor to the fuel-air inlet against which the fuel particles engage, in combination with an electrically conductive surface in the path of flow of the fuel-iar mixture from the carburetor to the combustion zone of the thermal combustion engine downstream of said member, a source of electrical DC energy, means connecting the positive terminal of said source of said member, and means connecting the negative terminal of said source to said surface whereby the liquid fuel particles are contact charged positive on passing through said member and are impelled by electrostatic attraction to flatten against said surface for rapid evaporation, the improvement wherein:

said electrically insulating means comprises a carrier member formed from an electrically insulating material and disposed across the passageway,



with said carrier being planar and defining a closed perimeter opening extending transversely of the plane thereof and extending therethrough that is aligned with the passageway.

said carrier member opening defining a socket in circummambient relation about the passageway.

said foraminous member defining a peripheral flange that is lodged in said socket.

an annular electrogenetic voltage producing assembly received in said socket and including a contact element engaging the carburetor and forming the negative terminal,

said assembly comprising said source,

and means for grounding the carburetor to said surface and comprising said connecting means.

3,963,409

CATALYTIC HEATING UNIT

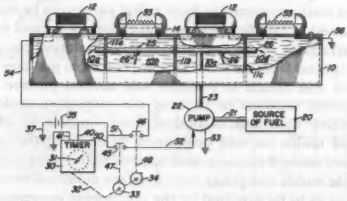
William J. Casto, 319 N. Peachtree, Ponca City, Okla. 74601

Filed Apr. 16, 1973, Ser. No. 351,263

The portion of the term of this patent subsequent to Nov. 15, 1991, has been disclaimed.

Int. Cl.² F23N *5/22*

U.S. Cl. 431—28 **2 Claims**



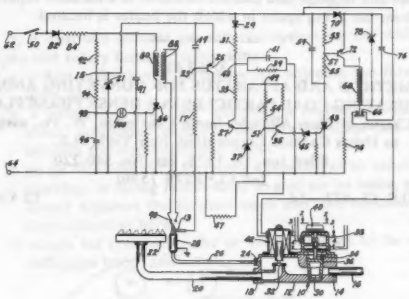
1. A catalytic heater comprising fluid compartment means, catalytic burner element means positioned over said fluid compartment means and in communication therewith, a heating element means positioned between said burner element

means and said fluid compartment means, a supply of fuel, means for communicating said fuel to said fluid compartment means, pump means having an input connected to said fuel communication means, means for controlling the fuel flow through said pump including a timer, a first means controlled by said timer for operating said pump for a predetermined period of time, a power means and a second means for operation said power means for a predetermined interval of time, whereby said power means will energize said heating element means thereby initiating said catalytic action.

3,963,410
CONTROL SYSTEM FOR DOMESTIC GAS OVEN BURNERS

Robert L. Baysinger, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 20, 1975, Ser. No. 560,126
Int. Cl.² F23Q 9/14
U.S. Cl. 431—46 **14 Claims**

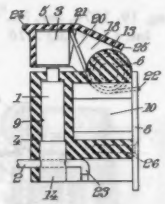


1. In a burner control system,
a pilot burner,
a main burner,
an electrical power source,
electrically operated means operative when energized to cause fuel to be supplied to said main burner,
circuit means including controlled solid state switching means connecting said electrically operated means across said power source,
a gating circuit for said switching means connecting one side of said power source to the controlling electrode of said switching means,
said gating circuit including first and second controlled solid state switching means,
circuit means responsive to the existence of pilot flame operative to effect conduction of said first switching means, and
temperature responsive circuit means operative to effect on and off conduction of said second switching means,
said temperature responsive means comprising:
temperature variable resistance means responsive to change in ambient temperature of a space heated by said main burner,
circuit means connecting said resistance means across said power source and including means operative to apply a predetermined voltage across said resistance means, and
means connecting the control electrode of said second switching means to one side of said resistance means.

3,963,411
PIEZOELECTRIC LIGHTERS NOTABLY FOR DOMESTIC APPLIANCE BURNERS AND THE LIKE

Jacques Challet, Le Puy, France, assignor to Constructions Electriques R.V., France

Filed Dec. 3, 1974, Ser. No. 529,041
Claims priority, application France, Dec. 7, 1973, 73.43829; Nov. 22, 1974, 74.38442
Int. Cl.² F23Q 2/16, 7/06
U.S. Cl. 431—255 **14 Claims**

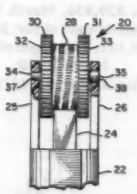


1. A piezoelectric lighter mountable on a domestic appliance burner or the like, particularly a gas appliance, of the type comprising a piezoelectric module adapted to receive an impact at one end thereof, said lighter comprising a case of insulating material containing said module, an electrode emerging from the case, the end of the module opposite that receiving the impact being connected to said electrode, a hammer lever of insulating material, a percussion hammer borne by said hammer lever, said hammer lever being adapted to pivot around an axle of said case, a spring arranged to cause the pivoting of said hammer lever, and means for providing electrical continuity between said one end of said module and the metallic mass of the applicance, said means for providing electrical continuity including said spring, said spring being connected both to the metallic mass of the percussion hammer and to a metal plate for fixing the lighter to the applicance.

3,963,412
UNITARY SPARK AND THUMB WHEEL

Stephen Peter Chernock, Flax Mill Lane, Milford, Conn. 06460

Filed Dec. 23, 1974, Ser. No. 535,274
Int. Cl.² F23Q 1/02
U.S. Cl. 431—273 **5 Claims**



1. A spark and thumb wheel unit comprising a solid, substantially cylindrical, one-piece single stock, homogeneous member incorporating
A. a spark-producing portion comprising:
a. a first diameter, and
b. an abrasive peripheral surface,
B. a rotation-controlling portion comprising:
a. a second diameter greater than said first diameter, and
b. positioned for easy, controlled rotation of said spark producing portion, and
C. trunnion means integrally formed on the substantially flat sides of said spark and thumb wheel, for cooperation with

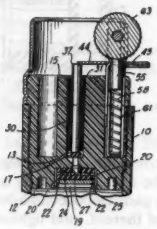
trunnion supports to securely and rotatably hold said spark and thumb wheel unit in a lighter system without necessitating a through-hole member extending through the entire spark and thumb wheel.

3,963,413

CIGARETTE LIGHTER HAVING IMPROVED VALVE MEANS

John C. Lockwood, Atlanta, and Harry L. Vaughan, Lawrenceville, both of Ga., assignors to Scripto, Inc., Atlanta, Ga.

Filed Aug. 19, 1974, Ser. No. 498,457
Int. Cl.² F23Q 2/16
U.S. Cl. 431—276 5 Claims



1. A cigarette lighter comprising a body defining a fuel reservoir and a passage way extending from the reservoir to the body exterior said passageway having a stepped inner portion; an elongated sleeve disposed within said passageway being sealed to said body and having a groove extending its length; a solid valve stem movably disposed within said sleeve; resilient sealing means between said valve stem and stepped portion of said passageway for contacting said valve stem and said stepped portion of said passageway for controlling the flow of fuel; and actuation means for allowing varied positioning of said valve stem within said sleeve to control the flow of fuel between the reservoir and body exterior so that said fuel flow is directed adjacent said actuation means.

3,963,414

APPARATUS FOR SEQUESTERING COMBUSTION GAS OF AN OPEN BURNER

Fred H. Jensen, 172 W N. Camano Drive, Camano Island County, Wash. 98292

Division of Ser. No. 339,936, March 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 247,722, April 26, 1972, Pat. No. 3,799,142. This application Dec. 9, 1974, Ser. No. 531,210
Int. Cl.² F23D 13/14
U.S. Cl. 431—329 5 Claims

1. A catalytic space heater for heating a living space comprising an upright catalytic bed having one surface openly exposed to the living space and having a sheet gas flow of substantially smokeless gaseous combustion products upward alongside said exposed surface, and a plenum chamber having in one wall thereof a slot extending along the upper margin of said upright catalytic bed exposed surface adjacent to one edge of the sheet gas flow, said exposed surface guiding the flow of gas toward said slot for flow of gas from such sheet gas flow through said slot into said plenum chamber, and said plenum chamber having an outlet leading to a location separated from the living space in which the heater is located, said plenum chamber flaring lengthwise of said slot toward said outlet.

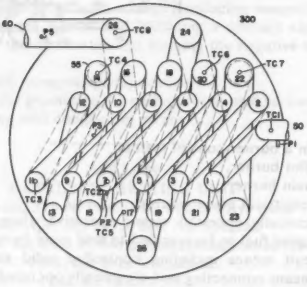
3. A catalytic space heater for heating a living space comprising an upright backing, an upright catalytic bed carried by said backing, having one surface opening exposed to the living space and producing a sheet gas flow of substantially smokeless gaseous combustion products upward alongside said exposed surface, a plenum chamber sealed to the upper portion of said backing, having horizontally-elongated passage means extending along the upper margin of said upright catalytic bed exposed surface and spanning substantially entirely along the width of such sheet gas flow alongside said exposed surface, said passage means having a width perpendicular to said catalytic bed substantially equal to the width of such sheet gas flow, said exposed surface guiding the flow of gas toward said passage means for flow therethrough into said plenum chamber and through said plenum chamber to a location separated from the living space in which the heater is located.

3,963,415

METHOD AND APPARATUS FOR CONVEYING AND/OR HEATING COAL PARTICLES IN A DENSE PHASE FLOW

Charles William Albright, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,220
Int. Cl.² F27B 15/00
U.S. Cl. 432—14 12 Claims



1. In a method of transporting coal particles in a dense phase flow through a transfer line, the improvement which comprises:

a. providing a dense phase of coal particles by fluidizing said particles with a non-oxidizing gas;

b. providing a transfer line which comprises at least a plurality of successively linked and serially aligned sections each having a uniform cross-sectional area separated by transition sections each having a varying cross-sectional area which is linearly enlarged a predetermined amount in cross-sectional area;

c. introducing said dense phase into a first one of said sections of uniform cross-sectional area at a predetermined entrance velocity;

d. causing said dense phase to leave said first section and each successive section of uniform cross-sectional area and enter the succeeding transition section linked thereto at a predetermined exit velocity, said exit velocity being

greater than said entrance velocity and below the velocity at which significant erosion occurs; and

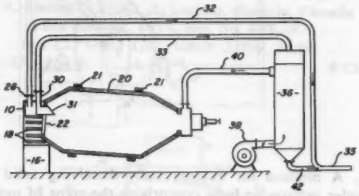
e. causing said dense phase to leave each transition section at said entrance velocity for introduction into the next section of successively larger, uniform cross-sectional area.

3,963,416

FURNACE EXHAUST SYSTEM

Vlastimil Frank Mach, Coon Rapids, Minn., assignor to General Resource Corporation, Hopkins, Minn.

Filed June 19, 1975, Ser. No. 588,189
Int. Cl.² F24F 9/00; F27D 7/00
U.S. Cl. 432—64 15 Claims



1. A dust and effluent gas removal system for use with an open end rotary furnace, comprising:

a. a dust collection hood positioned adjacent the furnace open end;

b. a pressurized air duct, including a plurality of air jet holes, positioned adjacent the furnace open end and beneath the dust collection hood;

c. an air receiving duct, including a plurality of air receiving openings in facing relationship to said air jet holes, positioned adjacent the furnace open end and beneath the dust collection hood;

d. means for connecting the air receiving duct to the dust collection hood; and

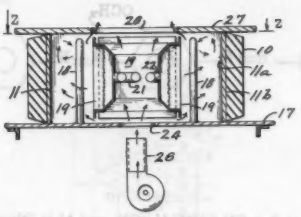
e. an effluent gas removal duct having a first end protruding into said furnace open end and having a second end passing through said dust collection hood.

3,963,417

METHOD AND APPARATUS FOR REMOVING SOLID TIRES FROM RIMS

Eugene W. Placek, Middleburg Heights, Ohio, assignor to International Magna Corporation, Cleveland, Ohio

Filed Dec. 26, 1974, Ser. No. 536,487
Int. Cl.² F24J 3/00
U.S. Cl. 432—225 5 Claims



5. Apparatus for removing a solid tire previously severed across its width from a circular band rim by destruction of the bond between the tire and the rim, comprising a base with means for supporting the rim and tire, and a generally annular array of outwardly directed gas-fired infrared heat generators connected to the base and directed toward the inside surface of the rim band, whereby heat applied to such inside surface is conducted through the band to expand the band so that the tire is freed from the band at least in part by slippage of the tire from the expanding band.

3,963,418

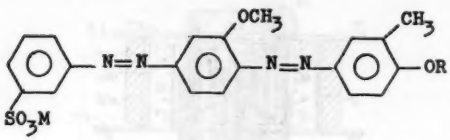
YELLOW DISAZO ACID DYE SOLUTION

Victor Tullio, Wilmington, Del., assignor to E. I. Du pont de Nemours and Company, Wilmington, Del.

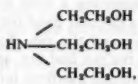
Filed Aug. 1, 1974, Ser. No. 493,972
Int. Cl.² C09B *31/06*; D06P *1/39*; C09B *31/08*
U.S. Cl. 8—41 B 7 Claims

1. A hard water-tolerant, storage stable, concentrated, aqueous monosulfonated disazo dye solution which comprises, by weight,

a. 10 to 25 percent of a monosulfonated disazo dye of the formula



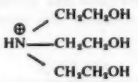
where R is $CH_3CH(C_2H_5)OH$, and M is lithium or



b. 5 to 25 percent of N-methyl-2-pyrrolidone,

c. 0.02 to 0.3 part of ethylenediaminetetraacetic acid anion per part of said dye,

d. cations selected from the group consisting of lithium and alkanolammonium of the formula



in an amount sufficient to provide a pH of 6.5 to 12, and

e. at least 50 percent water.

3,963,419

ANTIBACTERIAL LAUNDRY OIL AND DUST CONTROL COMPOSITION

Richard E. Ware, Trainer, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 292,054, Sept. 25, 1972, Pat. No. 3,915,877, which is a continuation-in-part of Ser. No. 174,236, Aug. 23, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 461,070
Int. Cl.² C09K *3/22*
U.S. Cl. 8—142 3 Claims

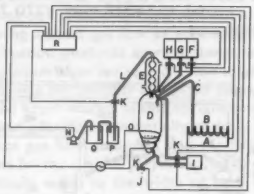
1. A process of laundering fabrics comprising immersing said fabric in a laundry oil composition of a mineral oil containing from about 0.02 to about 2.0% by weight of 8-hydroxyquinoline which can effectively migrate to hydrous dirt particles, causing a flow of the oil composition with respect to the fabric whereby the oil composition removes soil particles from the fabric, and removing the soil particles from the oil by filtration.

3,963,420

METHOD AND APPARATUS FOR AUTOMATICALLY DISSOLVING SAMPLES FOR ANAYLSIS

Ryutaro Matsumoto, Tokyo; Akihiro Ono, Yokohama, and Isamu Taguchi, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 30, 1973, Ser. No. 393,184
Claims priority, application Japan, Aug. 31, 1972, 47-86593; May 28, 1973, 48-59525; May 28, 1973, 48-59526
Int. Cl.² B01F *1/00*; G01N *31/00*
U.S. Cl. 23—230 R 8 Claims



1. A method for automatically dissolving solid analysis samples in powder form comprising the steps of providing a dissolving tank in which said powder samples are dissolved, providing a source of said powder samples externally of said tank, providing condenser means at the top of said tank, applying a vacuum to said tank through said condenser means to effect transfer of said powder samples from said source into said tank, adding a predetermined amount of dissolving solution to said tank, applying heat to said tank, dissolving said powder sample by application of said heat and said dissolving solution to said tank, withdrawing a predetermined amount of said dissolved sample solution from said tank and individually selectively controlling, by automatic control means, application of vacuum to said tank, addition of said dissolving solution, application of said heat to said tank, and withdrawal of said dissolved sample solution in order to effect automatic performance of said method.

3,963,421

TLC METHOD FOR DRUG DETECTION

Donald W. Jones, Auburn, Calif., assignor to Sierra Laboratories, Inc., Auburn, Calif.

Filed July 12, 1974, Ser. No. 487,957
Int. Cl.² B01D *15/08*; G01N *31/08*, *33/16*
U.S. Cl. 23—230 B 11 Claims

1. A thin-layer chromatographic method for detecting acidic, basic amine-containing or neutral drugs in a physiological medium which comprises:

agitating with a halocarbon-containing organic extractant an aqueous water-soluble inorganic salt-containing solution containing said physiological medium at a selected pH, wherein the amount of said salt is sufficient to provide a density of said aqueous medium greater than said organic extractant, whereby a substantial proportion of any of said drug is transferred to said organic extractant, said organic extractant consisting essentially of 40–60 volume percent chloroform, 15–20 volume percent alkanol of from 3 to 4 carbon atoms and 25 to 40 volume percent of an aliphatic hydrocarbon solvent of from 4 to 8 carbon atoms and the volume ratio of organic extractant to aqueous solution being in the range of 1–5:5;

incrementally transferring substantially free of said aqueous solution said organic extractant to an evaporating zone at a mildly elevated temperature containing a small absorbent disc, whereby a substantial proportion of said extractant is evaporated after each addition until completely evaporated and any of said drug present in said

extractant is substantially quantitatively transferred to said disc;

introducing said disc into a scored area adjacent one end of a thin-layer chromatographic plate and developing said thin-layer chromatographic plate using a polar organic developing solvent containing a small amount of ammonium hydroxide;

drying said thin-layer chromatographic plate and treating the dry thin-layer chromatographic plate with reagents for modifying the appearance of any of said drugs, so that colors characteristic of said drugs are produced.

3,963,422

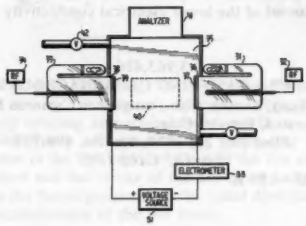
COUNTER FLOWING POSITIVE ION-NEGATIVE ION NEUTRALIZATION CHROMATOGRAPH

Robert A. Young, R.R. No. 2, Loretto, Ontario, Canada

Filed July 12, 1974, Ser. No. 488,187

Int. Cl.² G01J *1/42*; G01N *23/00*, *31/08*

U.S. Cl. 23—254 E **4 Claims**



1. A counter flowing positive ion-negative ion neutralization chromatograph for analyzing gas samples containing helium and a species which forms stable negative ions comprising

a channel constructed of electrically non conducting material for receiving said gas sample;

a first helium resonance lamp having an emission at **584A**;

a window in said first lamp partially transparent to radiation at **584A**, said lamp being mounted with said window extending within said channel;

a second helium resonance lamp having an emission at 584A and opposite the first helium lamp;

a window in said second lamp partially transparent to radiation at **584A**, said second lamp being mounted with said window extending within said channel, said windows being spaced in opposing relationship;

means for simultaneously exciting said lamps;

means for maintaining potential difference between the windows; and

means in said channel for measuring the intensity, wavelength, and position of emitted radiation between said windows.

3,963,423

CATALYTIC REACTOR HAVING ANNULAR CATALYST TRAY MEANS

Karl Heinz Dörr, Mainz; Waldemar Weber, Frankfurt am Main; Hugo Grimm, Frankfurt am Main, and Gustav Rowedder, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 12, 1974, Ser. No. 488,137

Claims priority, application Germany, July 26, 1973, 2337958

Int. Cl.² B01J *8/04*; C01B *17/68*

U.S. Cl. 23—288 R **7 Claims**

1. Catalytic reactor for the catalytic reaction of SO_2 to SO_3, comprising

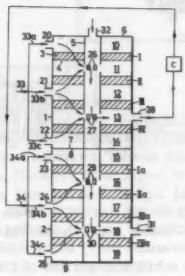
a. a plurality of separate reaction chamber means;

b. each reaction chamber means containing a hollow central column and at least three annular catalyst tray means vertically spaced apart one over the other with the inner edges thereof in contact with said central column;

c. each annular catalyst tray means consisting of catalyst means and gas-permeable plate means;

d. a first gas space before the uppermost catalyst tray means, common gas spaces between adjacent catalyst tray means, and a last gas space after the lowermost catalyst tray means;

e. inlet means for feeding partial streams of SO_2-containing gas into alternate gas spaces starting with said first gas space, the partial streams fed into said common gas spaces being divided such that a portion flows through the upper tray means and the balance through the lower tray means;



f. the gas spaces downstream and adjacent to said alternate gas spaces communicating with inlets in the hollow column for allowing partial streams of gases to enter said hollow column after they pass through a catalyst tray means;

g. said hollow column having a common outlet for combined partial gas streams communicating with a gas space other than an alternate gas space;

h. conduit means for supplying said gases to the inlet means of said alternate gas spaces and conduit means connected to the gas space in communication with the common outlet of the central column; and

i. cooling means for cooling the combined gases flowing from one reaction chamber means to the next via the conduit means connected to the gas space in communication with the common outlet of the central column.

3,963,424

COOLING AQUEOUS ALKALI METAL HYDROXIDE LIQUORS BY VACUUM EVAPORATION WITH SUBSEQUENT SOLIDS PRECIPITATE REMOVAL

Frank Bella, Jr., South Holland, Ill., assignor to Whiting Corporation, Harvey, Ill.

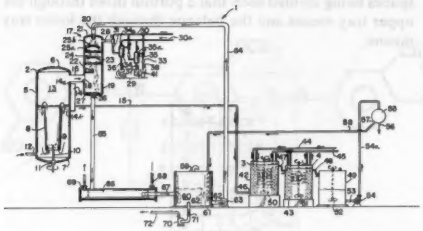
Filed May 14, 1973, Ser. No. 359,985

Int. Cl.² B01D *9/00*

U.S. Cl. 23—296 **18 Claims**

1. The process of treating an aqueous caustic soda liquor-solids slurry having a dissolved sodium chloride concentration of at least 1.5% by weight to reduce the temperature and the sodium chloride concentration thereof, said process comprising the steps of: feeding said aqueous caustic soda liquor-solids slurry to a body of said liquor contained in an initial cooling stage which includes an evaporating chamber maintained at a subatmospheric pressure and equipped with means for circulating said liquor body in a flow pattern adapted to maintain substantial uniformity of concentration throughout said liquor body wherein water vapor is evolved from said slurry body; contacting said evolved water vapor with a stream of relatively solids-free aqueous caustic soda liquor having a

temperature and dissolved sodium chloride content below that of said aqueous caustic soda liquor-solids slurry feed and a vapor pressure below the absolute pressure in said evolved water vapor in a vessel which is in direct communication with said evaporating chamber; withdrawing a liquid caustic soda-solids slurry stream from said body of caustic soda liquor in said evaporating chamber, said withdrawn steam having a temperature below the temperature of said caustic soda-solids slurry feed; cooling said withdrawn caustic soda liquor-solids slurry stream in a second cooling stage, withdrawing a stream of further cooled caustic soda liquor-solids slurry from said cooling stage, said withdrawn stream of further cooled caustic



soda liquor-solids slurry having a solids constituent which includes sodium chloride crystals; feeding said further cooled caustic soda liquor-solids slurry into a liquid-solids separation device wherein a substantial portion of the solids constituent thereof is removed therefrom to produce a relatively solids-free caustic soda liquor; removing said relatively solids-free caustic soda liquor from a first outlet in said liquids-solids separation device, said liquid-solids separation device also including a second outlet through which the solids constituents removed from the slurry are discharged; and, supplying at least a portion of said relatively solids-free caustic soda liquor to said vessel for contact with said water vapor.

3,963,425

COMPOSITE MATERIALS

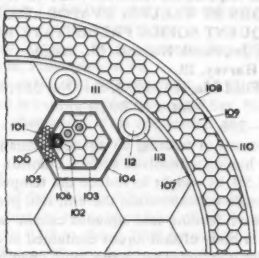
David John Sambrook, Warley, England, assignor to Imperial Metal Industries (Kynoch) Limited, England

Continuation of Ser. No. 242,368, April 10, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,993

Claims priority, application United Kingdom, Apr. 15, 1971, 9496/71; Feb. 17, 1972, 7427/72

Int. Cl.[2] B21C *37/00*; B21F *19/00*; B23P *3/00*

U.S. Cl. 29—191.4 **8 Claims**



1. A superconducting composite including bundles of longitudinally extending filaments,

i. each bundle including longitudinally extending superconductor filaments

a. each filament being surrounded by and in good electrical contact with a matrix material

b. the matrix material comprising longitudinally extending cells of a metal of high electrical conductivity surrounded by a material of lower electrical conductivity

c. the arrangement of the matrix material within the bundle being such that where at least two superconductor filaments are circumferentially circumscribed by a single annulus of the metal of high electrical conductivity, the annulus is electrically interrupted by a radially extending wall of the material of the lower electrical conductivity

ii. the bundles being surrounded by and in good electrical contact with a further matrix material

a. the further matrix material comprising longitudinally extending cells of a metal of high electrical conductivity surrounded by a material of lower electrical conductivity

b. the arrangement of the further matrix material around the bundles being such that where at least two bundles are circumferentially circumscribed by a single annulus of the metal of high conductivity, the annulus is electrically interrupted by a radially extending wall of the material of the lower electrical conductivity

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3,963,426

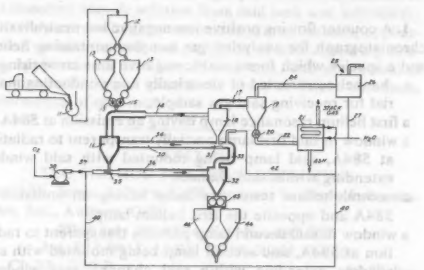
PROCESS FOR GASIFYING CARBONACEOUS MATTER

John W. Hand, Aurora, Colo., assignor to Cameron Engineers, Incorporated, Denver, Colo.

Filed July 22, 1974, Ser. No. 490,775

Int. Cl.[2] C10J *1/00*

U.S. Cl. 48—197 R **5 Claims**



1. A process for producing synthesis gas from the reaction of solid particulate carbonaceous material with oxygen and steam, wherein the improvement comprises the steps of:

a. drying the solid particulate carbonaceous material to essentially zero water content without pyrolysis or oxidation by direct contact with a fluent stream of hot synthesis gas product from step (g);

b. separating the dried carbonaceous material from the moist synthesis gas;

c. removing the water from the moist synthesis gas from step (b) and heating said water to form steam;

d. mixing said steam with oxygen;

e. heating said steam and oxygen mixture by direct fluent stream contact with hot ash residue from step (g);

f. contacting said dried carbonaceous material directly with said heated steam and oxygen mixture produced in step (e) thereby to gasify said carbonaceous material to produce a hot fluent stream of synthesis gas product and ash residue;

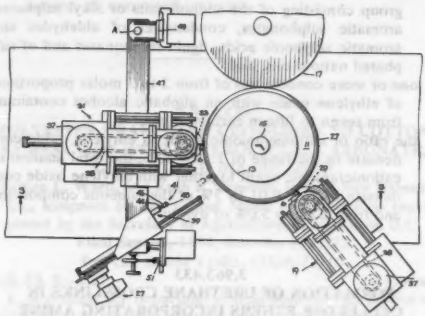
g. separating said hot synthesis gas product from said hot ash residue; and

h. recovering synthesis gas product from step (c).

3,963,427
METHOD FOR IMPROVING TIRE UNIFORMITY

John Walter Ugo, Warren, Mich., assignor to Uniroyal Inc., New York, N.Y.

Filed July 26, 1974, Ser. No. 491,979
Int. Cl.² B24B 1/00
U.S. Cl. 51—281 R 7 Claims



1. A method of improving the uniformity of an inflated, pneumatic tire in a continuous operation while the tire is continuously rotating, comprising the steps of:

a. simultaneously and continuously measuring both the variation in the free radial run-out of the tire along both shoulders and the center of the tire tread and the variation in the forces generated in the radial direction around the circumference of the tire tread;

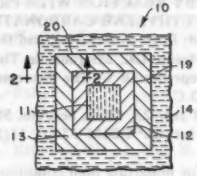
b. while continuing step (a), grinding either or both shoulders of the tire tread to correct excessive variation in the radial forces, and simultaneously with said force grinding of the shoulders, grinding the center of said tire tread to correct excessive variation in the free radial run-out; and

c. upon completion of step (b) but while continuing step (a), grinding either or both shoulders of the tire tread to correct excessive variation in the free radial run-out thereof but terminating said shoulder radial run-out grinding if said shoulder radial run-out grinding causes an adverse effect on the radial forces.

3,963,428
PRINTING OF TEXTILE ARTICLES

Daniel C. Stark, La Grange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 3, 1974, Ser. No. 430,525
Int. Cl.² D06P 3/00, 5/00
U.S. Cl. 8—14 12 Claims



1. A process for printing a textile material having a relatively porous surface comprising the steps of applying to adjacent surface areas of the material dissimilarly colored liquid dyestuffs so as to produce a boundary line therebetween, and subsequently applying to the boundary line a narrow line of dyestuffs so as to be retained in the upper portion of the porous material adjacent the surface in overlying relation to the boundary line to effectively hide the same from view.

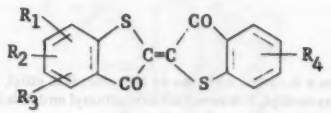
9. A textile material having a relatively porous printed surface comprising adjacent areas of dissimilar colors defining a boundary line therebetween, and a narrow line of color overlying the boundary line to hide the same effectively from view.

3,963,429
COLORING OF ORGANIC MATERIALS WITH ASYMMETRIC THIOINDIGOID COMPOUNDS

Michihiro Tsujimoto, Tachikawa; Kisuke Osawa, Yokohama, and Ichiro Okubo, Hachioji, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 431,696
Claims priority, application Japan, Jan. 17, 1973, 48-7012; May 22, 1973, 48-56328
Int. Cl.² D06P 1/22
U.S. Cl. 8—38 24 Claims

1. In a method of coloring synthetic or semisynthetic organic high molecular weight material in brilliant nuance with characteristic fluorescence by (A) fixation of the coloring material on the synthetic or semisynthetic high molecular weight organic material by (i) heating the organic material in an aqueous dispersion of the coloring material; (ii) printing the coloring material onto the organic material; or (iii) impregnating the organic material with an aqueous dispersion of the coloring material; or (B) admixing the coloring material with the molten synthetic or semisynthetic high molecular weight organic material, the improvement comprising using as said coloring material an asymmetric thioindigoid compound having the formula:



wherein R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of a hydrogen atom, chlorine atom, lower alkyl group, lower alkoxy group, cyclohexyl group, phenyl group, tolyl group, chlorophenyl group, benzyl group, methylbenzyl group, chlorobenzyl group and styryl group, R_1 and R_2 may together form a tetramethylene ring, R_4 is a member selected from the group consisting of a hydrogen atom and methyl group with the proviso that R_4 is a methyl group when R_1, R_2, and R_3 are each a hydrogen atom and R_4 is a hydrogen atom when R_1 is a methyl group and R_2 and R_3 are each a hydrogen atom.

3,963,430

CONCENTRATED SOLUTIONS, MISCIBLE WITH WATER IN ANY RATIO OF ANIONIC DYESTUFFS

Konrad Nonn, and Kuno Wagner, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,703

Claims priority, application Germany, May 9, 1974, 2422386

Int. Cl.² C09B 5/62; D06P 1/02

U.S. Cl. 8—39 R 5 Claims

1. Stable, concentrated solutions, miscible with water in any ratio, of azo dyestuffs containing sulphonic acid groups and anthraquinone dyestuffs containing sulphonic acid groups, characterised in that they contain association compounds of lactams with polyalcohols, either in water or in further water-miscible solvents or in a mixture of water and further water-miscible solvents.

3,963,431

METHOD OF DYEING WITH DISPERSIBLE AZO ANILINO DYESTUFFS

Stefan Koller, Ramlinsburg; Dieter Reinker Seltisberg, and Hans Rudolf Schwander, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

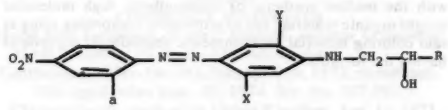
Continuation-in-part of Ser. No. 106,550, Jan. 14, 1971, abandoned. This application Mar. 29, 1974, Ser. No. 456,198

Claims priority, application Switzerland, Oct. 2, 1970, 14665/70

Int. Cl.² D06P 1/02; C09B 29/24

U.S. Cl. 8—41 C 4 Claims

1. A method for the dyeing of polyester textile fibers which comprises contacting the said polyester textile fibers with a dyeing composition containing as an essential component a dyestuff of the formula



wherein a is cyano, chlorine or bromine, R is ethyl, phenyl or phenoxymethyl, Y is lower alkoxycarbonyl and X is hydrogen, lower alkyl or lower alkanoylamino.

3,963,432

AQUEOUS COMPOSITIONS FOR USE IN APPLYING DYESTUFFS

Frank Hauxwell, and Henry Roy Murton, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 407,952, Oct. 19, 1973, abandoned. This application Mar. 13, 1974, Ser. No. 450,864

Claims priority, application United Kingdom, Oct. 27, 1972, 49584/72

Int. Cl.² C09B 67/00; D06P 1/58, 1/62

U.S. Cl. 8—93 10 Claims

1. Aqueous surface active agent compositions having improved wetting properties for use in applying dyestuffs to solid surfaces which contain,

one or more cationic surface active agents selected from the group consisting of alkyltrimethylammonium halides, alkylbenzyldimethylammonium halides, alkylpyridinium halides, alkylquinolinium halides, alkylinidazolinium halides and alkylmorpholinium halides, or

one or more anionic surface active agents selected from the group consisting of the sodium salts of alkyl sulphates, aromatic sulphonates, condensates of aldehydes and aromatic sulphonic acids, lignin sulphonates and of sulphated natural oils, and

one or more condensates of from 2 to 3 molar proportions of ethylene oxide with an aliphatic alcohol containing from seven to fifteen carbon atoms,

the ratio of cationic/anionic agent to ethylene oxide condensate in the range of 1:3 to 20:1, the total amount of cationic/anionic agent together with ethylene oxide condensate is from 0.01 to 5% of the aqueous composition and from 0.01 to 5.0% of dyestuff.

3,963,433

FORMATION OF URETHANE CROSSLINKS IN CELLULOSE ETHERS INCORPORATING AMINE GROUPS BY USE OF PROPYLENE OR ETHYLENE CARBONATE

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 23, 1975, Ser. No. 598,466

Int. Cl.² D06M 11/00, 13/10

U.S. Cl. 8—120 4 Claims

1. A process for imparting high conditioned (dry) and high wet wrinkle recovery to partially aminoethylated cotton fabric, the process comprising:

a. impregnating a cotton fabric which has been aminoethylated to a degree of substitution of about 0.05 with a heterocyclic carbonate selected from the group consisting of ethylene carbonate, propylene carbonate, and a mixture of ethylene and propylene carbonate and about 2% of potassium carbonate to a pickup of about 100%,

b. placing the wet, impregnated fabric in a vacuum oven preheated to a temperature of about from 140° to 160°C,

c. evacuating the oven to obtain a pressure of about 35 mm of mercury,

d. maintaining the temperature and vacuum for about from 30 to 180 minutes to obtain reaction wherein urethane-type crosslinks are attained, and

e. releasing the vacuum and washing the reacted fabric to remove all unreacted material.

3,963,434

CARBOXYMETHYLATED COTTON FABRIC WITH IMPROVED CONDITIONED AND WET WRINKLE RECOVERY BY REACTION WITH PROPYLENE OR ETHYLENE CARBONATE

Truman L. Ward; Ruth R. Benerito, and Dorothy M. Perrier, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 23, 1975, Ser. No. 598,494

Int. Cl.² D06M 13/10, 13/54

U.S. Cl. 8—120 4 Claims

1. A process for imparting high conditioned (dry) and high wet wrinkle recovery to partially carboxymethylated-cotton fabric, the process comprising:

a. impregnating a cotton fabric which has been carboxymethylated to a degree of substitution of about from 0.1 to 0.3 by a non-aqueous procedure, with a neat heterocyclic carbonate selected from the group consisting of ethylene carbonate, propylene carbonate, and a mixture of ethylene and propylene carbonate, to a pickup of about 100%,

b. placing the wet, impregnated CMC fabric in a vacuum oven preheated to a temperature of about from 160° to 180°,
c. evacuating the oven to obtain a pressure of about 35 mm of mercury,
d. maintaining the temperature and vacuum for about from 30 to 120 minutes to obtain reaction, and
e. releasing the vacuum and washing the reacted fabric to remove all unreacted material.

3,963,435

POLYESTER GRAFTS AND CROSSLINKS TO COTTON BY REACTION WITH HETEROCYCLIC CARBONATE, GLYCOL, AND DIBASIC ACID

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 8, 1975, Ser. No. 611,373
Int. Cl.² D06M *11/02, 13/10, 13/16*
U.S. Cl. 8—120 **4 Claims**

1. A process for imparting wrinkle recovery properties to unmodified cellulosic fabric, the process comprising:
a impregnating a cellulosic fabric to about 100% takeup with a solution containing 50 parts by weight of a cyclic carbonate selected from the group consisting of ethylene carbonate and propylene carbonate, 50 parts by weight of diethylene glycol, and 1 part by weight of a dibasic acid soluble in the glycolcarbonate mixture,
b placing the wet impregnated fabric in a vacuum oven preheated to about from 160° to 180°C,
c evacuating the oven to obtain a pressure of about 35 mm of Hg,
d maintaining the temperature of (b) and the pressure of (c) for a reaction time of about from 30 to 120 minutes, and
e washing the reacted fabric with water to remove unreacted material.

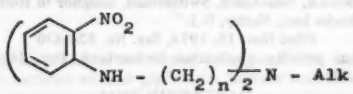
3,963,436

BIS NITROPHENYL DIETHYLENE TRIAMINE DYEING OF SYNTHETIC ACID MODIFIED FIBERS

Reinhard Mohr, Offenbach am Main, and Konrad Löhe, Rembrucken, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 17, 1975, Ser. No. 558,784
Claims priority, application Germany, Mar. 21, 1974, 2413515
Int. Cl.² D06P *5/00*
U.S. Cl. 8—168 A **8 Claims**

1. In a process for the dyeing of high-molecular substrates containing acidic groups with basic nitro groups containing dyestuffs the improvement consisting of contacting said substrate with a dyestuff of the formula



wherein Alk is alkyl of 1 to 6 carbon atoms, *n* is 2 to 6 and wherein the phenyl nuclei can be substituted by halogen, carboalkoxy of 2 to 5 carbon atoms, nitro, sulfamoyl, sulfon amide mono- or di-(lower alkyl)-amide, carbamoyl, carboxylic acid mono- or di-(lower alkyl)-amide, cyano, lower alkyl, lower alkoxy, lower alkanoylamino or lower alkylsulfonyl or a mixture of said dyestuffs.

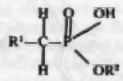
3,963,437

FLAME RETARDANT PROCESS FOR CELLULOSIC MATERIAL INCLUDING CYANAMIDE, PHOSPHONIC ACID, ANTIMONY OXIDE AND POLYMERIC HALOGEN-CONTAINING MATERIAL

Destin A. LeBlanc, and Robert Bruce LeBlanc, both of Wickford, R.I., assignors to Cotton Incorporated, New York, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,106
Int. Cl.² D06M *13/30, 13/44*
U.S. Cl. 8—192 **8 Claims**

1. A process for rendering cellulosic fiber-containing material flame retardant, which process comprises
contacting the material with cyanamide, at least one phosphonic acid represented by the structural formula:



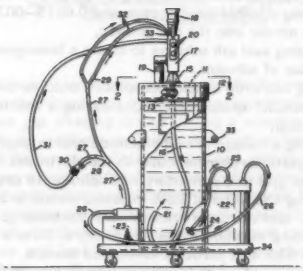
wherein R^1 represents a monovalent radical selected from the group consisting of hydrogen, halogen, hydroxy, lower alkyl and lower alkoxy; and wherein R^2 represents a monovalent radical selected from the group consisting of hydrogen and lower alkyl; antimony oxide and a flame-retardant polymeric halogencontaining material selected from the group consisting of halogenated vinyl and vinylidene polymers and copolymers to deposit on the cellulosic fiber-containing material a flame retarding amount of the phosphonic acid, cyanamide, antimony oxide and polymeric halogen-containing material.

3,963,438

METHOD OF STERILIZING A FIBEROPTIC PROCTOSCOPE

Armin V. Banez, 510 Gypsy Lane, Suite 1, Youngstown, Ohio 44515

Filed June 21, 1974, Ser. No. 482,024
Int. Cl.² A61L *1/00, 3/00;* **B08B** *3/08, 9/02*
U.S. Cl. 21—58 **2 Claims**



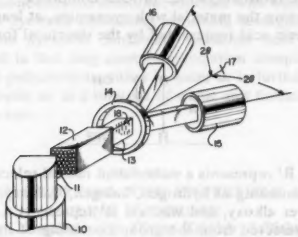
1. The method of sterilizing a fiberoptic scope having a hand-eye piece and an elongated flexible body member having an open end, an exterior surface and an interior first fluid conveying channel comprising the steps of immersing said flexible body member in a sterilizing solution, positioning the open end of said flexible body member to direct solution to emerge towards the exterior surface of another portion of said flexible body member and circulating said sterilizing solution through said fluid conveying channel in said flexible body member for a time sufficient to sterilize said fluid conveying channel and the exterior surface of said flexible body member of said fiberoptic scope.

3,963,439

MULTIELECTRODE APPARATUS AND TECHNIQUES TO PREPARE ALIGNED ASBESTOS FIBERS ON A THIN SUBSTRATE

Laverne S. Birks, Potomac, Md., and Mohammad Fatemi, McLean, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,728
Int. Cl.² B29D 3/02; G01N 23/20, 31/06, 31/12
U.S. Cl. 23—230 PC 3 Claims



1. A method of preparing a sample containing asbestos for the purpose of determining the amount of asbestos in said sample; which comprises,

collecting pollutant samples which may contain asbestos on a millipore filter,

placing said millipore collected into a test tube and ashing the same for about 2½ hours,

dispersing said ashed sample in an aquous solution of dioctyl sodium sulfosuccinate,

reducing the total mass of particulate material in said solution by mild centrifugation for about 30 seconds to eliminate the largest particles in said solution,

filtering said solution to collect any asbestos and other fine particles and washing with deionized water to remove soluble materials,

placing said filter and any asbestos and particulate matter collected thereon into a container and ashing same,

subsequent to ashing, dropping 30 drops of a solution containing distilled amyl acetate and 0.001%–002% of cellulose nitrate into the ash residue,

sonicating said ash solution to insure a homogeneous distribution of asbestos,

placing one drop of said ash solution onto an electrode grid of parallel spaced electrodes having a spacing of about 0.8 mm,

applying a voltage to said electrode grid to align said asbestos particles perpendicular to the electrodes of said electrode grid and permitting said solution to dry,

spraying a solution of 2.5% cellulose nitrate in amyl acetate onto said dried particles on said electrode grid,

permitting said latter solution to dry to form a thin plastic film with said particles embedded therein,

stripping said particle embedded plastic film from said electrodes and,

placing said particle embedded plastic film onto a ring type holder and permitting same to dry.

3,963,440

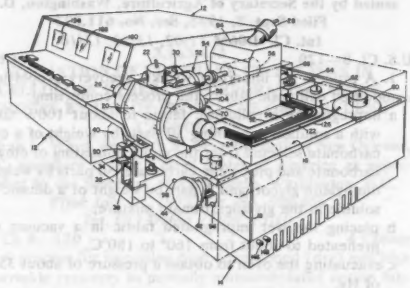
ANALYSIS SYSTEM

Bernard Stein, Andover, and Philip Spergel, Lexington, both of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed June 27, 1974, Ser. No. 483,610
Int. Cl.² G01N 27/00, 31/00, 33/16
U.S. Cl. 23—253 R 15 Claims

1. An analysis system for measuring a plurality of parameters of a fluid sample comprising a tempering chamber for containing a tempering fluid to maintain a stable temperature environment in the chamber,

first and second measuring systems, each said measuring system including an electrode assembly that has an elongated electrode housing and a sensing electrode disposed in said housing, first and second flow through measuring cells corresponding respectively to said first and second measuring systems and mounted in said tempering chamber, each said measuring cell having an inlet port, an outlet port and a flow through passage between said inlet and outlet ports, the sensing electrode of each measuring system being disposed immediately adjacent its corresponding measuring cell, said measuring cells being located centrally within said tempering chamber and said elongated electrode housings extending into said tempering chamber with the axes of said elongated electrode housings disposed generally perpendicular to one another,



system inlet structure including an entrance port, conduit connecting said entrance port of said system inlet structure to the inlet ports of both of said measuring cells,

positive displacement pump structure,

conduit connecting the outlet ports of both of said measuring cells to said positive displacement pump structure, and

flush fluid supply, said system inlet structure being movable between a first position where its said entrance port is exposed to receive a fluid sample to be analyzed and a second position where its said entrance port is immersed in flush fluid in said flush fluid supply, operation of said pump with said system inlet structure in said first position adapted to flow a sample through both of said measuring cells and operation of said pump with said system inlet structure in said second position flowing flush fluid through both of said measuring cells.

3,963,441

ARTICLE WITH A LYOPHILIZED IMMUNOREACTIVE SELF-ADHERING COATING

Rolf Dietrich, Neu-Aesch, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

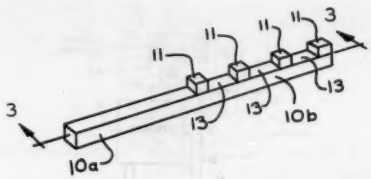
Filed Nov. 18, 1974, Ser. No. 524,430
Claims priority, application Switzerland, Dec. 10, 1973, 17272/73
Int. Cl.² G01N 33/16
U.S. Cl. 23—253 R 15 Claims

1. An article useful for immunological determinations which article comprises a carrier material having at least part of one surface thereof physically coated with an immunological reactive material which is provided in stable and self-adhering form in the absence of a bonding reagent by applying a suspension of said immunological reactive material to said carrier material, drying and then lyophilizing.

3,963,442
COLORIMETRIC INDICATOR COMPOSITIONS AND METHOD OF MANUFACTURE

Wade A. Bullard, Sturgis, Mich., and Donald B. Stahlman, Indianapolis, Ind.

Filed Dec. 4, 1974, Ser. No. 529,343
Int. Cl.² G01N 31/22
U.S. Cl. 23—253 TP 29 Claims



1. The article of manufacture useful as a colorimetric indicator which comprises:

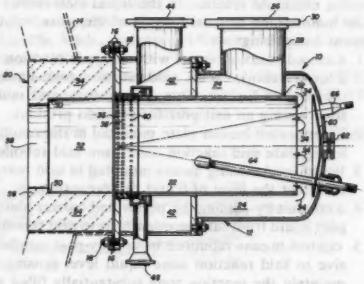
a. a first reagent composition which is reactive with a second reagent composition contained in a liquid carrier to produce an identifiable color; and

b. a solid body of a water soluble thermoplastic resin which is also soluble in the liquid carrier for the second reagent composition at ambient temperatures admixed with the first reagent composition in an amount sufficient for at least a qualitative colorimetric detection of the second reagent composition in the liquid carrier which is applied to an exposed surface of the resin and dissolves the resin at the surface without permeating the body of the resin.

3,963,443
ACID GAS BURNER AND SULFUR RECOVERY SYSTEM

Desmond H. Bond; George W. Taggart, both of Dallas, and Kurt Scott Jaeger, Hurst, all of Tex., assignors to Ford, Bacon & Davis Texas Incorporated, Garland, Tex.

Filed Sept. 23, 1974, Ser. No. 508,671
Int. Cl.² C01B 17/04; F23C 5/28; F23D 15/02
U.S. Cl. 23—262 49 Claims



1. In a system for converting hydrogen sulfide into sulfur which includes an acid gas burner furnace combination for converting about one-third of the hydrogen sulfide in said gas stream to sulfur dioxide; means for cooling the products of combustion from said acid gas burner furnace combination and removing liquid sulfur therefrom; catalytic reactor means for converting the resulting mixture of sulfur dioxide and hydrogen sulfide to sulfur; and means for cooling the product from the catalytic reactor means and removing liquid sulfur therefrom, the improvement wherein said acid gas burner comprises:

a. an elongated gas flow chamber having a first end which carries an air inlet thereto and a second end which carries an outlet therefor;

b. a thermal reaction chamber communicating with said outlet of said second end of said elongated gas flow chamber and in axial alignment with said elongated gas flow chamber;

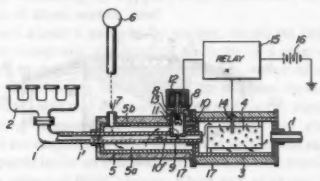
c. an air injection means for injecting air into said elongated gas flow chamber through said air inlet thereof toward said outlet thereof and uniformly about the inner periphery of said elongated gas flow chamber to thereby provide an axial air flow with a substantially parabolic velocity front from said air inlet through said elongated gas flow chamber to said outlet thereof; and

d. a gas nozzle means positioned adjacent said second end and around said elongated gas flow chamber, and directed into said elongated gas flow chamber and toward said thermal reaction chamber for injecting acid gas in a converging direction within said axial air flow to thereby impinge within said thermal reaction chamber.

3,963,444
SECONDARY AIR SUPPLY MEANS OF EXHAUST GAS CLEANING DEVICES

Mitsumasa Yamada, Shizuoka, and Youji Kitamura, Kariya, both of Japan, assignors to Nippondenso Co., Ltd. and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 425,731, Dec. 18, 1973, which is a division of Ser. No. 191,880, Oct. 22, 1971, abandoned. This application June 13, 1975, Ser. No. 586,649
Claims priority, application Japan, Dec. 26, 1970, 46-140313[U]
Int. Cl.² F01N 3/14
U.S. Cl. 23—277 C 3 Claims



1. A secondary air supply control system for use with an exhaust gas cleaning device for an internal combustion engine, said exhaust gas cleaning device having a reaction chamber provided in an exhaust conduit of said engine between the engine and the terminal of said conduit end, said system comprising a portion of said exhaust conduit upstream of said reaction chamber being a double wall structure having an inner wall defining an exhaust gas passage from said engine to said reaction chamber and an outer wall spaced radially outwardly from said inner wall defining an outer chamber between said inner wall and said outer wall,

a first opening in said outer wall adjacent an upstream end thereof,

an air supply pump communicated to said first opening for introducing a secondary air through said first opening into said outer chamber causing said secondary air to be brought into heat-exchange contact with said inner wall,

a second opening in said outer wall adjacent a downstream end thereof for communicating said outer chamber with the surrounding atmosphere,

a third opening in said exhaust conduit for communicating said outer chamber with said exhaust gas passage, said third opening being substantially radially aligned with said second opening,

a valve means including a valve member positioned between and movable radially between said inner and outer walls

between a first position, in which said second opening is closed and said third opening is opened, and a second position, in which said second opening is opened and said third opening is closed,

means disposed in said reaction chamber for detecting the temperature therein, said air supply means being operative independently of said temperature detecting means,

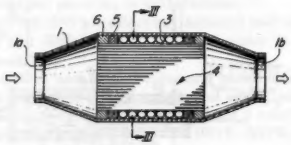
means operable in response to a signal from said temperature detecting means to cause said valve member to be moved from one of said first and second positions to the other of said positions, the arrangement being such that, when the temperature in said reaction chamber is below a predetermined temperature, said valve member is moved said first position supplying secondary air which has been heated in said outer chamber by contacting said exhaust gas passage when heated during operation and, when the temperature in said reaction chamber is higher than said predetermined temperature, said valve member is moved to said second position, the supply of the secondary air from said outer chamber into said exhaust gas passage and then into said reaction chamber and the release of the secondary air from said outer chamber to the atmosphere being automatically controlled.

3,963,445

EXHAUST EMISSION CONTROL DEVICE OF THE CATALYST TYPE

Toshihiko Koyama; Masahiro Nanri, both of Kariya; Kazuma Matsui, Toyota, and Shigeo Hoshino, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Aug. 3, 1973, Ser. No. 385,339
Claims priority, application Japan, Aug. 22, 1972, 47-83941
Int. Cl.² F01N *3/15*; B01J *8/00*
U.S. Cl. 23—288 FC **2 Claims**



1. An exhaust emission control device of the catalyst type for internal combustion engines mounted on motor vehicles comprising,

a container having an exhaust inlet and outlet port,

a catalyst element of honeycomb carrier having a catalyst component thereon and a plurality of axially disposed exhaust passages therein and extending between one end and an opposite end of said carrier, said catalyst element being disposed in said container for purifying exhaust gases flowing through said container,

a metallic woven fabric disposed in an annular space between said container and said catalyst element and extending longitudinally between said ends of said carrier, the longitudinal ends of said fabric being short of the ends of said carrier, for absorbing the forces of impact or vibration exerted on said container, and

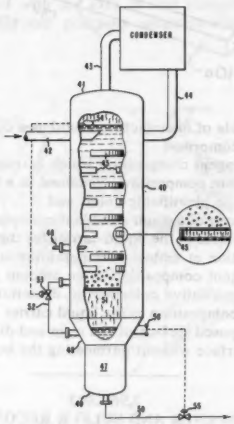
exhaust leak preventing means made of a fibrous flexible ceramic material and mounted between said container and catalyst element at the opposite ends of said metallic woven fabric for sealing said annular space, each said leak preventing means extending into said annular space and being longitudinally spaced from said preventing means at the other end by said metallic woven fabric for preventing leak of the exhaust gases which might otherwise flow through a gap between said container and catalyst element.

3,963,446

APPARATUS FOR CONDUCTING A CONTINUOUS CHEMICAL REACTION WITH INTERNAL RECYCLE

Donald Nelson Miller, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 442,908, Feb. 15, 1974. This application Jan. 14, 1975, Ser. No. 540,845
Int. Cl.² B01J *8/00*; B01D *3/42*
U.S. Cl. 23—288 A **3 Claims**



1. Apparatus for conducting a continuous, catalyzed, reversible chemical reaction in the liquid state under pressure while maintaining internal recycle of the more volatile liquid present comprising:

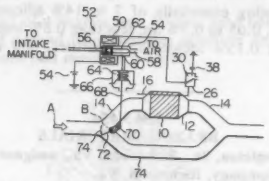
1. a closed reaction vessel with an upper reaction zone and a lower reboiler zone, said reaction zone having an entrance port for reactants and catalyst, and said reboiler zone having an exit port for reaction product;
2. a perforated barrier plate mounted in the reaction vessel to separate said reaction zone from said reboiler zone;
3. liquid level sensing means mounted in said reaction zone to detect the level of liquid reactants therein;
4. a conduit by-passing the perforated barrier plate to transport liquid from said reaction zone to said reboiler zone;
5. control means mounted in said by-pass conduit responsive to said reaction zone liquid level sensing means to maintain the reaction zone substantially filled with reactants in the liquid state;
6. liquid level sensing means mounted in the reboiler zone to detect the level of liquid therein;
7. a conduit connected to said exit port to remove liquid product from the reboiler zone, said conduit having mounted therein control means responsive to said reboiler liquid level sensing means, maintaining liquid in the reboiler zone at a predetermined level;
8. heating means to maintain liquid in said reboiler zone at a higher temperature than in said reaction zone; and
9. means to inject a catalyst sequestering agent into a lower region of said reaction zone.

3,963,447

CATALYTIC REACTOR FOR EXHAUST GASES

Yoshimasa Hayashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Continuation-in-part of Ser. No. 219,402, Jan. 20, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,792
Claims priority, application Japan, July 20, 1971, 46-64081
Int. Cl.² F01N *3/15*; B01J *8/02*
U.S. Cl. 23—288 FA 5 Claims



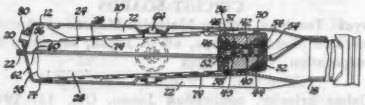
1. A catalytic reactor system for a vehicle, connected in use to an internal combustion engine, said catalytic reactor system comprising means defining an exhaust flow path for the exhaust gases of an internal combustion engine comprising a main flow path and a by-pass flow path, a catalyzer bed in said main flow path, selecting valve means for selecting between said main flow path and said by-pass flow path as the exhaust flow path for said exhaust gases, means defining a secondary flow path through said catalyzer bed and separate from said exhaust flow path for a flow of air to effect heating of the air flow through said secondary flow path by said catalyzer bed to render the temperature of said air flow proportional to the temperature of said catalyzer bed but substantially less than said temperature of said catalyzer bed, temperature sensing means to sense the temperature of said flow of air in said secondary flow path, control means responsive to said temperature sensing means for actuating said selecting valve means to select said main flow path when said temperature sensed is below a predetermined value and to select said by-pass flow path when said temperature sensed is above a predetermined value.

3,963,448

TWO-BED CATALYTIC CONVERTER

Frederick J. Hartley, Waterford, Wis., and Michael R. Foster, Columbiaville, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 310,717, Nov. 30, 1972, abandoned. This application Nov. 21, 1974, Ser. No. 525,772
Int. Cl.² F01N *3/15*
U.S. Cl. 23—288 FB 4 Claims



1. A two-bed catalytic converter for automobile use comprising in combination: a top housing plate, a bottom housing plate, and a catalyst retaining means also having top and bottom plates therebetween, said top and bottom housing plates and at least one of said catalyst retaining plates having mating peripheral faces over substantially their entire peripheries to form a layered assembly suitable for sealing substantially along the entire length of the mating peripheries, a partition member within said catalyst retaining means that divides the catalyst retaining means into an upper and lower catalyst bed, said partition comprising upper and lower plates having an air distribution member therebetween, said upper and lower plates and air distribution member each having a plurality of evenly distributed openings through which exhaust gases flow from the upper to the lower catalyst bed, said air distribution member being formed by two overlying plate members with outwardly drawn portions defining a plurality of air nozzle means each having an air outlet adjacent the openings through said air distribution member and with the said nozzle means being connected to similarly formed continuous air passage means between said overlying plates, inlet air passage means including an inlet air nozzle interconnected with said continuous air passage means formed between said overlying plates to supply air from an outside source through said air passage means to said nozzle means, said air outlets of said nozzle means being adjacent each of said openings through said overlying plates of the air distribution member to discharge the air directly into the flow of exhaust gases through the openings in the overlying plates.

3,963,449

SINTERED METALLIC COMPOSITE MATERIAL

Shigeru Seki; Taketoshi Kato; Toshikuni Itou, and Hiroo Sasaki, all of Nagoya, Japan, assignors to Ishizuka Garasu Kabushiki Kaisha, Japan

Filed Apr. 29, 1974, Ser. No. 464,931
Claims priority, application Japan, May 4, 1973, 48-50001
Int. Cl.² B22F *3/00*, *1/04*; C22C *33/02*
U.S. Cl. 29—182.5 10 Claims

1. A sintered metallic composite material which comprises a mixture of

a. sintered particles of a substrate metal selected from the group consisting of copper, iron, aluminum, silver and alloys of these metals, and

b. at least about 1 percent by weight, based on the weight of the composite material, of particles of a glass-ceramic having metallic ions dispersed therein, some of said metallic ions having been caused to migrate through said glass-ceramic and diffuse towards and to the surface in a reducing atmosphere thereby forming the elemental metal corresponding to said metallic ions at the surface of said particles as an integral part thereof, said metallic ions being selected from copper, silver and mixtures thereof, wherein said particles of glass-ceramic (b) are uniformly dispersed in the composite material and firmly retained therein through bonds between the substrate metal (a) and said elemental metal.

6. The sintered metallic composite material of claim 1 wherein said glass-ceramic is selected from the group consisting of silica-alumina-lithia, silica-alumina-lithia-magnesia, silica-alumina-zinc oxide, silica-alumina-magnesia, silica-alumina calcium oxide and silica-lithia.

3,963,450

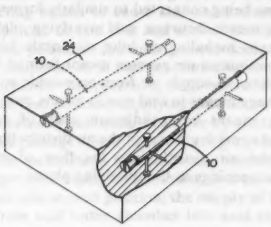
REINFORCED CAST PRODUCT AND METHOD OF MAKING

Barry J. Davies, Burlington, Canada, assignor to Canron Limited, Montreal, Canada

Filed July 24, 1974, Ser. No. 491,460
Int. Cl.² B22D *19/02*
U.S. Cl. 29—191.4 7 Claims

1. A reinforced casting comprising a body of cast ferrous metal having enclosed therein at least one composite reinforcing member comprising a tubular metal sheath completely surrounding the central portion of a reinforcing rod slidably

mounted within said sheath, opposite ends of said reinforcing rod projecting outwardly from opposite ends of the tubular



metal sheath and being secured against movement with respect to said casting.

3,963,451

METHOD OF FORMING A HIGH-TEMPERATURE ABRASION-RESISTANT COATING ON A FERROUS METAL SUBSTRATE, AND RESULTING ARTICLE

Robert H. Kachik, Apollo, and Arthur J. Pignocco, Murrysville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1973, Ser. No. 332,987

Int. Cl.² B32B *15/18*

U.S. Cl. 29—196.1 **5 Claims**

1. An abrasion resistant metal composite comprising a ferrous metal substrate and a hard facing ferrous metal layer thereover having a thickness greater than 0.1 inch metallurgically bonded to said substrate by an aluminothermic reduction reaction, said hard facing layer consisting essentially of iron and from 4 to 7 percent boron to yield a ferrous matrix containing from 45 to 80 volume percent Fe_2B.

3,963,452

CONNECTOR PLATE STOCK

John Calvin Jureit, Coral Gables, and Gerald E. Robey, Miami, both of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Filed Oct. 4, 1974, Ser. No. 512,314

Int. Cl.² F16B *15/08*

U.S. Cl. 29—193.5 **9 Claims**

1. Connector stock plate comprising a sheet metal plate having a plurality of teeth formed therefrom to project to one side of said plate and leaving a plurality of elongated openings in said plate, said teeth being provided in a plurality of transversely spaced, longitudinally extending rows of slots, with said teeth and said slots being distributed over substantially the entire surface of said plate, said stock plate having a plurality of transversely spaced score lines extending in longitudinal, generally parallel directions, parallel to and between selected adjacent longitudinally extending rows of teeth and between slots left in the plate by said teeth, said stock plate also having a plurality of longitudinally spaced score lines extending in transverse generally parallel directions, and in a direction generally normal to the slots left in the plate by said teeth and intersecting at least some of said slots, whereby at least four discreet connector plates are defined in said stock plate, said score lines each defining weakened portions along the stock plate whereby the said discreet connector plates are separable one from the other and from the stock plate.

3,963,453

BRAZING MATERIALS

Ogle R. Singleton, Jr., Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 10, 1974, Ser. No. 531,393

Int. Cl.² B32B *15/20*

U.S. Cl. 29—197.5 **6 Claims**

1. An article which comprises an aluminum alloy core and an outer cladding layer, the outer cladding layer being bonded to one side of the aluminum alloy core and being made of an alloy consisting essentially of 7 to 14% silicon, 0.2 to 2% magnesium, 0.05 to 0.3% tin, less than 0.6% iron, 0.3% manganese and 0.15% incidental impurities, and a balance of aluminum.

3,963,454

BRAZING MATERIALS

Ogle R. Singleton, Jr., Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 10, 1974, Ser. No. 531,391

Int. Cl.² B32B *15/20*

U.S. Cl. 29—197.5 **6 Claims**

1. An article which comprises an aluminum alloy core and an outer cladding layer, the outer cladding layer being bonded to one side of the aluminum alloy core and being made of an alloy consisting essentially of 7 to 14% silicon, 0.2 to 2% magnesium, 0.05 to 3% lead, less than 0.6% iron, 0.3% manganese and 0.15% incidental impurities, and a balance of aluminum.

3,963,455

ELECTRODEPOSITED GOLD PLATING

Fred I. Nobel, and Barnet D. Ostrow, both of Roslyn, N.Y., assignors to Lea-Ronal, Inc., Freeport, N.Y.

Continuation of Ser. No. 323,287, Jan. 12, 1973, abandoned. This application Feb. 26, 1975, Ser. No. 553,145

Int. Cl.² B32B *15/00*

U.S. Cl. 29—198 **2 Claims**

1. A base metal or base-metal alloy having a tungsten alloyed barrier coating electrodeposited thereon and an electrodeposited gold or gold alloy plating on said barrier coating, wherein the metal alloyed with tungsten is cobalt or nickel and is alloyed therewith in an amount that will affect the electrodeposition of the tungsten in alloyed form on the base metal and containing a sufficient amount of tungsten to significantly inhibit diffusion of the base metal or base-metal alloy into the gold layer electrodeposited thereon at a thickenss of less than about 50 microinches.

3,963,456

AUTOMATIC ASSEMBLY APPARATUS FOR INSERTING ELECTRONIC CONNECTING PINS TO AND/OR FOR MOUNTING ELECTRONIC PARTS ON PRINTED CIRCUIT BOARDS

Noriyuki Tsuchiya, Tokyo; Motohiro Murano, Yokosuka, and Seiichiro Murata, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 9, 1974, Ser. No. 513,519

Claims priority, application Japan, Oct. 15, 1973, 48-115467

Int. Cl.³ H05K *3/30*

U.S. Cl. 29—203 B **4 Claims**

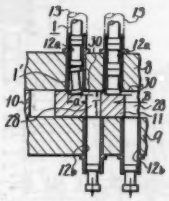
1. An automatic assembly apparatus adapted for mounting leadless electronic parts on a printed circuit board, comprising:

a. first and second spaced apart fixed members, said first member having an aperture for receiving electronic parts, said second member having an aperture displaced from a central axis of said first fixed member aperture;

b. a reciprocating movable member slidably disposed between said first and second spaced apart fixed members, said movable member having an aperture for receiving

the parts from said first member aperture when aligned with said movable member aperture, said movable member aperture having a recess extending therefrom and adjacent said first fixed member, said recess having a length at least equal to a displacement between the first and second fixed member apertures along which said movable member communicates, said movable member aperture having a depth larger than the maximum length of said parts while the reduced depth of said aperture at said recess is smaller than the minimum length of said parts;

c. one end of a flexible part feeding pipe being connected to said second fixed member aperture on the opposite side from said movable member;



d. a pipe fixing plate having a part receiving aperture, one end of said aperture connecting with the other end of said flexible feeding pipe; and

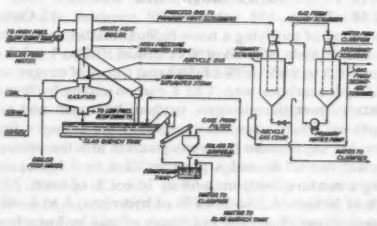
e. mounting means disposed below said pipe fixing plate for mounting said parts on a circuit board aligned with said mounting means, said mounting means comprising a mask plate having a rectangular aperture aligned with said pipe fixing plate aperture and having a length and height at least equal to the length and height of the parts, and a slidable plate disposed under said mask plate for receiving and dispensing said part on the printed circuit board by moving between said mask plate and printed circuit board.

3,963,457

COAL GASIFICATION PROCESS

Martin Hess, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1974, Ser. No. 522,257
Int. Cl.² C10J 3/16
U.S. Cl. 48—202 **4 Claims**



1. A coal gasification process known as the Koppers-Totzek process wherein pulverized coal, oxygen and steam are introduced through opposed burner heads into a gasifier and react therein to produce slag and a product gas that is thereafter scrubbed, wherein the improvement comprises:

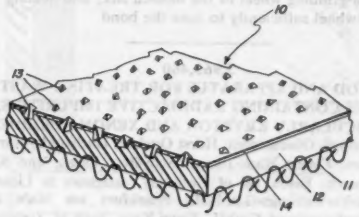
a. recycling scrubbed product gas to mix with and cool said product gas prior to scrubbing.

3,963,458

COATED ABRASIVE MATERIAL

Matthew T. Gladstone, Scotia, and Stanley J. Supkis, Averill Park, both of N.Y., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 131,027, April 5, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,106
Int. Cl.² C09K 3/14
U.S. Cl. 51—295 **16 Claims**



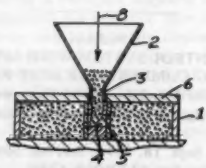
1. In coated abrasive material comprising a flexible backing member, an adhesive bond on the front surface of said backing member, and abrasive grains firmly affixed by the adhesive bond to the backing member, a multiplicity of said abrasive grains extending outwardly from the adhesive bond, the improvement comprising a supersize coating over the adhesive bond which adhesive bond comprises a maker adhesive and a size adhesive, the size adhesive at least comprising a first heat hardened resinous composition, and said supersize coating over said heat hardened coating comprising a dried, fused, elastomeric material selected from the group consisting of polymers of a monomer which when polymerized results in substantial residual unsaturation and copolymers of such aforementioned monomer with at least one monomer copolymerizable therewith, said elastomeric material being active in increasing the cutting ability of the coated abrasive material, and said coating including a sufficient amount of antioxidant therein, at least 4% by weight, said antioxidant selected from the group consisting of napthylamines, alkylated phenols, polyalkyl polyphenols, hydroquinones, and mixtures thereof whereby said elastomeric material is stabilized against decomposition by heat generated while the coated abrasive material is being used, said supersize coat including a solid particulate metal fluoride grinding aid in an amount not more than 60% of the total supersize coating weight.

3,963,459

BLOW MOLDING PROCESS FOR MANUFACTURING GRINDING WHEELS

Daniel Robert Vinard, Enghien-les-Bains, France, assignor to Norton Company, Worchester, Mass.

Filed Oct. 3, 1973, Ser. No. 403,081
Claims priority, application France, Oct. 4, 1972, 72.35126
Int. Cl.² C09K 3/14; C04B 31/16
U.S. Cl. 51—298 A **3 Claims**



1. A method for manufacturing grinding wheels characterized in that a granulated mixture containing at least abrasive grains and bond grains within a hopper is introduced into a cavity of a closed mold by blowing with a compressed gas, said

mixture having a relatively uniform distribution of grain sizes proportioned within a formula where D is the mean diameter of the grains in the mixture, at least 90% of the grains have a diameter between 0.5 D and 2D, 2% at most have a diameter less than 0.1 D and the remainder a diameter falling in a range between 0.1 D and 0.5 D whereby a homogeneous mass is obtained when said mixture is poured into the hopper and is blown into the cavity of the mold, then compressing and reducing the volume of said mixture in the cavity of the mold to form a grinding wheel of the desired size, and heating the grinding wheel sufficiently to cure the bond.

3,963,460

METHOD AND APPARATUS FOR TREATING WASTE GASES CONTAINING RADIOACTIVE IMPURITIES, PARTICULARLY KRYPTON AND XENON NUCLIDES

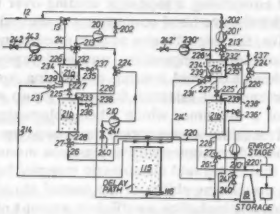
Willy Stumpf, Oberstedten; Horst Queiser, Hochstadt; Harald Jüntgen, Essen; Hans-Jürgen Schrüter, Essen, and Karl Knoblauch, Essen, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main and Bergwerksverband GmbH, Essen-Kray, both of, Germany

Filed Apr. 4, 1976, Ser. No. 458,033

Claims priority, application Germany, Apr. 4, 1973, 2316831

Int. Cl.² B01D *53/04*

U.S. Cl. 55—66 **20 Claims**



1. A method of treating waste gases containing radioactive contamination by adsorption in an activated carbon delay path whose output gas stream is discharged to the atmosphere, comprising the steps of: initially passing the waste gas steam to be decontaminated through an adsorptive enrichment system until the first active component of the waste gas breaks through in unpermissible concentration at the outlet of the enrichment system, the gas fraction having been discharged from the enrichment system up to this point being substantially free from the radioactive impurities and constituting the poor gas fraction ; discharging the poor gas fraction at least in part into the atmosphere; after the breakthrough, regenerating the enrichment system by rinsing same with an inactive rinsing gas to desorb the active components, the then discharged desorption gas fraction constituting a rich gas fraction; and conducting only said rich gas fraction obtained by rinsing said enrichment system through the activated carbon delay path.

3,963,461

HUMIDITY CONTROL SYSTEM WITH APPARATUS FOR REMOVING COMBUSTIBLE DUST PARTICLES

William F. Stockford, and Joseph M. Gamewell, both of Salisbury, N.C., assignors to Gamewell Mechanical, Inc., Salisbury, N.C.

Filed Sept. 18, 1974, Ser. No. 506,935

Int. Cl.² B01D *47/00*

U.S. Cl. 55—20 **9 Claims**

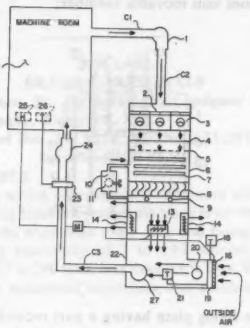
6. Method for maintaining the humidity of air within an enclosed, heat-imparting work area while removing combustible dust particles from contaminated return air removed therefrom comprising the steps of:

a. collecting said contaminated air from said work area and moving it through a conduit to a return air treating apparatus;

b. spraying a fine water mist into all of the dust contaminated return air to simultaneously saturate the air with moisture and to coalesce the combustible dust particles with water droplets;

c. separating said water droplets from the saturated air;

d. mixing a prescribed, regulated portion of the resulting purified, water saturated air with a prescribed, regulated quantity of outside air;



e. conveying the air mixture obtained in step (d) to said work area where said air mixture undergoes a predetermined temperature rise to reduce the relative humidity to a desired level;

f. the relative amount of return air and outside air used in said mixing step being automatically determined responsive to the existing relative humidity of said work area to thereby achieve a desired relative humidity when the mixture is heated in said work area.

3,963,462

METHOD OF PURIFYING A NEON-HELIUM MIXTURE

Georgy Anatolievich Golovko, Pushkin, 8, bulvar A. Tolstogo, 16, kv. 29, and Jury Yakovlevich Ignatov, ulitsa Kolomenskaya, 33/40, kv. 59, both of Leningrad, U.S.S.R.

Filed Feb. 5, 1975, Ser. No. 547,254

Claims priority, application U.S.S.R., Apr. 26, 1974, 2015807

Int. Cl.² B01D *53/02*

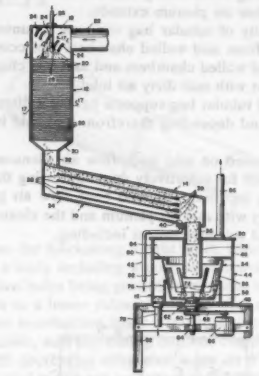
U.S. Cl. 55—25 **12 Claims**

1. A method of purifying a neon-helium mixture containing 2 to 7 vol.% of neon, 1 to 3 vol.% of helium, 0.5 to 1 vol.% of hydrogen, 88.5 to 96.5 vol.% of nitrogen, traces of oxygen and traces of hydrocarbons with 1 to 5 carbon atoms by freeing said mixture from the nitrogen, oxygen, hydrogen and said hydrocarbons, which comprises removing the nitrogen from said neon-helium mixture by dephlegmation at a temperature of from 67° to 77° K. and a pressure of 4 to 7 kgf/sq.cm.; obtaining a mixture containing 68 to 74 vol.% of neon, 22 to 74 vol.% of helium, 1.5 to 2 vol.% of hydrogen, 1 to 8 vol.% of nitrogen traces of oxygen and traces of said hydrocarbons; passing said mixture at a pressure of from 4to 7 kgf/sq.cm. through microporous adsorbents having micropores of size from 3 to 9 A, adsorbing the remaining nitrogen, oxygen, hydrogen and said hydrocarbons; desorbing the nitrogen, oxygen, hydrogen and hydrocarbons by a stepwise reduction of the pressure of said mixture from 4 to 7 kgf/sq.cm. down to 10^{-1} to 10^{-2} mm Hg, the adsorption and desorption steps being effected with the microporous adsorbents being thermostated with the aid of a cooling agent, viz. liquid nitrogen.

3,963,463
FOAM SCRUBBER

Glen P. Huppke, Land O Lakes, Fla., assignor to Environeering, Inc., Skokie, Ill.

Continuation-in-part of Ser. No. 190,893, Oct. 20, 1971, abandoned. This application Apr. 17, 1972, Ser. No. 244,890
Int. Cl.² B01D *53/14*
U.S. Cl. 55—178 9 Claims



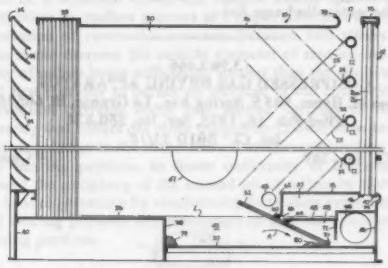
1. Apparatus for removing contaminants from a flowing gas stream comprising foam generator means for entrapping small discrete volumes of said gas within liquid film enclosures forming a mass of foam bubbles, said foam generator means including perforated means for supporting a film of liquid foaming material and forming said film into discrete bubbles filled with said gas moving through the perforations therein, said perforated means comprising a perforated member having formed pleats therein arranged with surfaces angularly intersecting said moving gas flow; sizing means for successively reforming said bubbles into smaller bubbles for maintaining a stable mass of small bubbles; soak chamber means for containing said mass of foam bubbles for movement away from said sizing means during a substantial soaking period ofor diffusion and collection of contaminants from said gas into said liquid film of the bubble walls; and foam breaker means receiving bubbles from said mass in soak chamber means for collapsing said foam bubbles to separate cleansed gas and contaminated liquid of said bubble walls.

3,963,464
GAS WASHER AND LIQUID TREATMENT SYSTEM

Edward N. Schinner, Silver Spring, Md., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 6, 1974, Ser. No. 448,760
Int. Cl.² B01D *47/06*
U.S. Cl. 55—228 11 Claims

1. An evaporative heat exchange apparatus comprising means for mixing atmospheric air and a liquid for evaporative transfer of heat from one to the other, liquid-air separator means downstream of said mixing means for separating the air from the liquid, sump means comprising horizontal bottom wall and upstanding side and end walls, said sump means being positioned to receive the liquid from said liquid-air separator means near one of said end walls and said sump means being formed to direct a substantially horizontal flow of said liquid in a given direction toward the other end wall, a liquid outlet near said other end wall of said sump means, strainer means for removing particulate matter from said flow path and depositing said matter on the bottom of said sump means, said strainer means including a strainer extending across the entire flow path within said sump means, said strainer extending up from the bottom wall of said sump means, strainer mounting means for securing the lower edge of said strainer on said bottom wall and for securing the upper edge of said strainer in the sump such that the strainer is slanted with respect to the horizontal so that its upper edge is positioned upstream of its lower edge in the horizontal flow of liquid through said strainer with the upper edge of said strainer extending at least

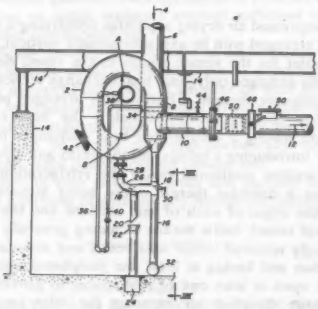


up to the upper level of the liquid flowing in said given direction along said flow path so that all of the liquid flowing through the sump must pass through the strainer, and liquid flow control means comprising a liquid flow control plate extending across the sump means between said strainer and said liquid outlet, said liquid flow control plate being configured to maintain an even flow of liquid along the strainer.

3,963,465
GAS LINE LOOP WATER SEAL

Norman J. Kirby, Worth Township, Cook County, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1975, Ser. No. 556,512
Int. Cl.² B01D *47/06*; F16K *9/00*
U.S. Cl. 55—238 5 Claims



1. A gas line loop water seal comprising

a gas pipe having a vertically disposed loop which has a vertically disposed gas entrance pipe extending upward from the loop and a vertically disposed gas exit pipe extending downward from the loop,

means located on the gas entrance pipe for supplying water to the inside of the pipe loop whereby water may be introduced into the loop to fill the lower part of the loop to a level sufficient to seal the loop against the passage of gas,

a generally horizontal gas outlet pipe connected to the exit pipe and directed away from the loop for directing gas away from the gas line loop,

a generally vertical water discharge line connected to the lower end of the exit pipe and extending downward away from the loop,

a drain line connected to the bottom of the loop and to the water discharge line for draining water from the loop into the water discharge line,

a valve in the drain line for controlling the flow of water from the loop and

means in the water discharge line below the connection to the loop drain line for preventing the flow of gas through the water discharge line.

3,963,466

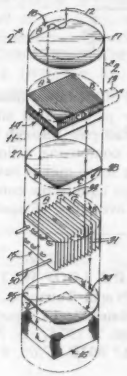
COMPRESSED GAS DRYING APPARATUS

William M. Hynes, 945 S. Spring Ave., La Grange, Ill. 60525

Filed Feb. 18, 1975, Ser. No. 550,624

Int. Cl.² B01D *35/18*

U.S. Cl. 55—269 **4 Claims**



1. A compressed air drying apparatus comprising a cylindrical vessel arranged with its axis substantially vertical; an inlet and an outlet for the vessel; means in the vessel defining a horizontally arranged polygonal heat exchange section having a heat exchanger therein, a horizontally arranged polygonal refrigeration section positioned below the heat exchange section and having a refrigerated heat exchanger including means for introducing a refrigerant thereinto and a polygonal demister section positioned below the refrigeration section and having a demister therein, there being arcuate spaces between the edges of each of said sections and the interior wall of said vessel; baffle means including generally circular plates snugly received within said vessel and associated with each section and having at least one peripheral segment removed to open at least one of said spaces to provide an air flow passage directing air entering the inlet sequentially through the heat exchange section, the refrigeration section, the demister section, and finally again through the heat exchange section to the outlet, said final passage through the heat exchange section being in heat exchange relation to, but out of direct contact with, air making the first passage through the heat exchange section.

3,963,467

DUST FILTER APPARATUS

David W. Rolschau, 6409 Ryan Ave. South, Minneapolis, Minn. 55435

Continuation of Ser. No. 339,418, March 8, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,248

Int. Cl.² B01D *46/04*

U.S. Cl. 55—284 **1 Claim**

1. A dust filter apparatus comprising:

a. a bag chamber,

b. a head mounted on said bag chamber,

c. said head having a dirty air inlet,

d. an air plenum mounted on said head with a common wall between said head and said air plenum,

e. said air plenum having a clean air discharge opening,

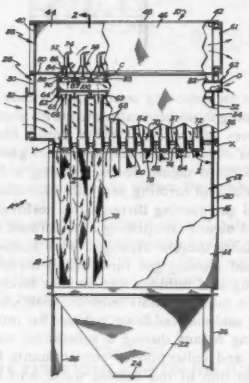
f. a back flow air plenum mounted within said head and extending at one end therefrom,

g. a multiplicity of walled chambers mounted in said head and extending transversely thereof and through which said back flow air plenum extends,

h. a multiplicity of tubular bag supports mounted on and depending from said walled chambers and communicating with said walled chambers and said bag chamber and in alignment with said dirty air inlet,

i. each of said tubular bag supports having a filter bag connected to and depending therefrom into said bag chamber,

j. means mounted on said back flow air plenum and said common wall for selectively communicating the interior of said bag supports with said back flow air plenum or alternatively with said air plenum and the clean air outlet thereof, said selective means including,



k. first ports formed in said back flow air plenum, and

l. second ports formed in said common wall in alignment with said first ports, and

m. valve means for closing or opening either of said first or second ports,

n. means for causing a low pressure area at said clean air outlet to cause air to flow from said dirty air inlet downwardly upon, through and upwardly within said filter-bags and through said head and said air plenum for exit out said clean air outlet.

o. means for causing a pressurized reverse air flow condition within the bag supports and outwardly through the bags and downwardly with said first mentioned downward airflow,

p. means having apertures through which said bag supports extend, said means being positioned below said dirty air inlet,

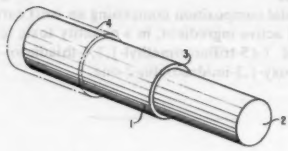
q. the area of said apertures being sized so as to create a pressure drop between the head and bag chamber thereby forcing the air to be distributed substantially equally across the head and to flow downwardly through the apertures and into the bag chamber, and

r. a hopper connected to said bag chamber for receiving collected dust.

3,963,468
LIGHT GUIDE FABRICATION

Raymond Edward Jaeger, Basking Ridge; John Burnette MacChesney, Stirling; Douglas Arthur Pinnow, Warren, and LeGrand Gerard Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 15, 1974, Ser. No. 442,747
Int. Cl.² C03C *25/02, 15/00*
U.S. Cl. 65—3 A 14 Claims

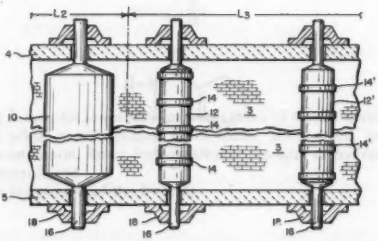


1. Process for fabricating a light guide which as fabricated comprises a body including a core region and a clad region, the refractive index being graded from a first value within the core region to a lesser value within the clad region in which the variation in refractive index is due to an increasing content of boron oxide, said increasing content corresponding in direction with decreasing refractive index, in which both core region and clad region are constituted of glass comprising heat treating a body consisting essentially of a borosilicate glass composition, said composition having a ratio of SiO_2 concentration to B_2O_3 concentration in the range between 1:1 and 30:1, within the temperature range of from 100°C below the softening point of the said borosilicate glass composition to the softening point of the said borosilicate glass composition so as to result in out-diffusion of boron oxide from the said borosilicate glass thereby producing (1) a core region of lesser boron oxide content than that of the corresponding region of the said borosilicate glass before processing, and (2) a clad region which is of a composition more nearly that of the corresponding region of the said borosilicate glass before processing in which the said body before processing includes 2 borosilicate surfaces and in which out-diffusion is smultaneously from the two surfaces.

3,963,469
GLASS SHEET ANNEALING LEHR

Andre Paul Pierre, Cambronne-les-Ribecourt, France, assignor to Saint-Gobain Industries, France

Filed Nov. 18, 1974, Ser. No. 525,023
Int. Cl.² C03B *18/02, 25/04*
U.S. Cl. 65—194 7 Claims



1. In a leer for annealing a continuous sheet or ribbon of float glass, said leer comprising means defining a chamber having an entrance end and an exit end, said chamber being divided into a high temperature portion adjacent the entrance end and a low temperature portion adjacent the exit end, and a plurality of glass supporting rollers in said chamber, the improvement comprising a first plurality of smooth-surfaced glass supporting rollers in said high temperature portion and a second plurality of glass-supporting rollers in said low temperature portion, the rollers of the second plurality having an outside diameter smaller than the rollers of said first plurality and having a surface including metallic-surfaced bearing portions of a common cylindrical surface axially spaced from each other by shallow grooves of a depth sufficient to permit circulation of convection currents between said rollers and glass borne thereon; the outside diameter of said second plurality of rollers being sufficiently smaller than the diameter of said first plurality to permit an increase in the circulation of convection currents about said second plurality of rollers whereby said rollers are more effectively cooled so as to prevent any change in the shape thereof and, in conjunction with said bearing portions, to foster uniformity of temperature around the periphery of the second set of rollers by allowing the heat to penetrate by conductivity from glass supported on said bearing portions into the rollers only in the zones of the bearing portions.

3,963,470
PROCESS FOR TREATING DECOMPOSABLE ORGANIC WASTE MATERIALS

Lester A. Haug, 7725 Anise Ave., Los Angeles, Calif. 90045

Continuation of Ser. No. 327,986, Jan. 30, 1973, abandoned. This application Dec. 27, 1974, Ser. No. 536,854
Int. Cl.² C05F *11/08*
U.S. Cl. 71—9 5 Claims

1. A process for the sustained treatment of decomposable wet sewage sludge to produce a partially dry humus-like substance, the steps comprising:

partially drying a first quantity of said wet material, spreading said first quantity of material to form an absorbent pad;

mixing with said first quantity of partially dry material an additional quantity of sewage sludge to produce a mixture having an initial moisture content sufficient to initiate aerobic decomposition;

periodically turning said mixture in ambient uncontrolled atmospheric air to aerate the same by exposure to naturally occurring quantities of ambient air until decomposition substantially ceases and said mixture is partially dry;

successively repeating said steps of adding wet material of the same or similar type and periodically turning the mixture until decomposition ceases; and

from time to time removing from said partially dried mixture a portion of partially dry humus-like substance.

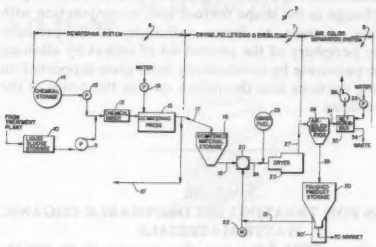
3,963,471
APPARATUS AND PROCESS FOR PRODUCING AN ORGANIC PRODUCT FROM SEWAGE SLUDGE

Quentin L. Hampton, 129 Anchor Drive, Daytona Beach, Fla. 32020

Filed June 19, 1974, Ser. No. 480,745
Int. Cl.² C05F *7/00*
U.S. Cl. 71—12 5 Claims

1. A process for producing an organic product from sewage sludge comprising mixing a predetermined quantity of liquid waste sewage sludge with a chemical for coagulating or flocculating the solids contained in the liquid sludge, subjecting the mixture to pressure for extracting a part of the moisture therefrom, draining off the extracted moisture, heat drying and pelletizing the dewatered material to produce pellets, subjecting the dry pelletized material to a suction action for separating dust and fine particles of sludge material from the pellets, discharging the separated pellets by gravity to storage, and mixing the dewatered material with a portion of the previously

produced pellets for drying and preheating the material prior to the heat drying and pelletizing thereof, so as to enable



drying temperatures to be low enough to prevent formation of clinkers and the ignition of the organic material.

3,963,472

PROCESS FOR PREVENTING CORROSION BY INCORPORATIVE SOLUBLE METAL CHROMATES IN FERTILIZER SOLUTIONS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed June 27, 1969, Ser. No. 837,295

Int. Cl.² C05B 7/00; C01B 15/16, 25/26; C23C 1/10

U.S. Cl. 71—33 **6 Claims**

1. In the method wherein an aqueous fertilizer solution having a solute concentration from 5 to 60 weight percent and a pH of 4 to about 13 and containing about 10 percent ammonium, expressed as nitrogen and 31 weight percent phosphate, expressed as P_2O_5, with about 50 percent of said phosphate as acyclic polyphosphate and the balance as orthophosphate is prepared, stored and handled and, in such method, contacts a metal which, under quiescent conditions, is passivated against corrosion from said solution by an orthophosphate-containing film, the improved method for preventing corrosion when said contact is under turbulent conditions which erode said film and thereby destroy said passivity that comprises incorporating an inhibitor consisting essentially of a soluble ammonium, alkali metal or alkaline earth metal chromate or dichromate in said solution in an effective amount to inhibit said corrosion.

3,963,473

THIADIAZOLYLIMIDAZOLIDINONE HERBICIDES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 441,611, Feb. 11, 1974, Pat. No. 3,932,438, which is a continuation-in-part of Ser. No. 375,203, June 29, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,792

The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

Int. Cl.² A01N 9/12

U.S. Cl. 71—90 **2 Claims**

1. A herbicidal composition comprising an inert carrier and as an essential active ingredient, in a quantity toxic to weeds, the compound 1-(5-trifluoromethyl-1,3,4-thiadiazol-2-yl)-3-methyl-5-hydroxy-1,3-imidazolidin-2-one.

3,963,474

HERBICIDE MIXTURES OF 3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES OR SALTS THEREOF AND 2-(METHYL, CHLOROPHENOXY)-N-METHOXYACETAMIDES

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 432,675, Jan. 11, 1974, abandoned, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Feb. 10, 1975, Ser. No. 548,387

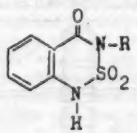
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 **10 Claims**

1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture consisting essentially of

a. a compound of the formula



where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, alkaline earth metal, ammonium, lower alkylammonium, lower hyroxyalkylammonium, or hydrazine salt thereof, and

b. a compound of the formula

where R denotes methoxy and X denotes phenoxymethyl bearing chloro and methyl substitutents in the phenyl radical in a weight ratio of *a* : *b* of 3:1 to 1:3.

3,963,475

HERBICIDAL MIXTURES OF 3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES AND 3,5-DIBROMO-4-HYDROXYBENZALDOXIME-O-(NITROPHENYL)ÉTHERS

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 432,676, Jan. 11, 1974, abandoned, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Feb. 10, 1975, Ser. No. 548,388

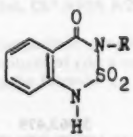
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—91 8 Claims

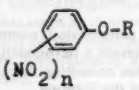
1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture consisting essentially of

a. a compound of the formula

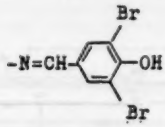


where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alklai metal alkaline earth metal, ammonium, lower alkylammonium, lower hydroxyalkylammonium or hydrazine salt thereof, and

b. a compound of the formula



where *n* denotes one of the integers 1 and 2, and R denotes the radical



in a weight ratio of a:b of 5:1 to 1:5.

3,963,476

3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES OR SALTS THEREOF AND 9-HYDROXYFLUORENECARBOXYLIC ACID-(9) AS HERBICIDAL MIXTURES

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilie Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 432,686, Jan. 11, 1974, abandoned, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Feb. 19, 1975, Ser. No. 548,434

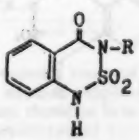
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—91 6 Claims

1. A process for controlling the growth of undesired plants among crop plants which comprises applying to the plants a herbicidally effective amount of a herbicide mixture consisting essentially of

a. a compound of the formula



where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, alkaline earth metal, ammonium, lower

hydroxyalkylammonium, lower alkylammonium or hydrazine salt thereof, and

b. 9-hydroxyfluorenecarboxylic acid-(9) in a weight ratio of a:b to 3:1 to 1:3.

3,963,477

HERBICIDAL MIXTURES OF S-HALOBENZYL-N,N-DIALKYLTHIOLCARBAMATES AND 3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES AND SALTS THEREOF

Adolf Fischer, Mutterstadt, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 343,347, March 21, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,129

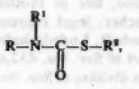
Claims priority, application Germany, Apr. 13, 1972, 2217721

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 **3 Claims**

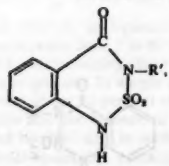
1. A process for controlling the growth of unwanted plants which comprises treating said plants postemergence with a herbicidally effective amount of

a. a compound of the formula



wherein R and R^1 each denote lower alkyl and R^2 denotes benzyl substituted by halogen, and

b. a compound of the formula



wherein R' denotes lower alkyl of a maximum of four carbon atoms or an alkali metal, alkaline earth metal, ammonium, lower alkylammonium, lower hydroxylalkylammonium, or hydrazine salt thereof, the weight ratio of a to b being in the range of 1:3 to 3:1.

3,963,478

HERBICIDE MIXTURES EMPLOYING O,S-DIMETHYLTETRACHLOROTHIOTEREPHTHALATE

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 432,686, Jan. 11, 1974, abandoned, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Feb. 26, 1975, Ser. No. 553,297

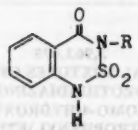
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 **6 Claims**

1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture consisting essentially of

a. a compound of the formula



where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, alkaline earth metal, ammonium, lower alkylammonium, lower hydroxyalkylammonium or hydrazine salt thereof, and

b. O,S-dimethyltetrachlorothioterephthalate, in a weight ratio of a:b, of 5:1 to 1:3.

3,963,479

HERBICIDE MIXTURES OF 3-LOWER ALKYL-2,1,3-BENZOTHIADIAZINONE-(4)-2,2-DIOXIDES OR SALTS THEREOF AND 4-HALOBUTYNYL-N-HALOPHENYL CARBAMATES

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 432,685, Jan. 11, 1974, abandoned, which is a division of Ser. No. 343,629, March 22, 1973, Pat. No. 3,888,655. This application Mar. 17, 1975, Ser. No. 559,321

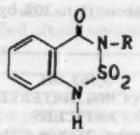
Claims priority, application Germany, Apr. 13, 1972, 2217722

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 **8 Claims**

1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidally effective amount of a mixture of herbicides consisting essentially of

a. a compound of the formula



where R denotes lower alkyl of a maximum of 4 carbon atoms, or an alkali metal, alkaline earth metal, ammonium, lower alkylammonium, lower hydroxyalkylammonium, or hydrazine salt thereof, and

b. a compound of the formula

where R denotes chlorophenyl and R^1 denotes 4-chlorobutynyl in a weight ratio of *a:b* of 5:1 to 1:5.

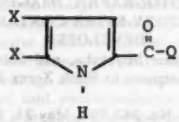
3,963,480

HERBICIDAL PYRROLE-2-CARBOXAMIDES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 349,973
The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.
Int. Cl.² A01N 9/22
U.S. Cl. 71—95 19 Claims

1. A herbicidal composition consisting essentially of an effective herbicidal amount of (A) a compound as the active ingredient and having the formula:



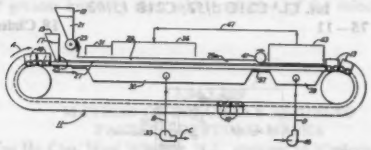
wherein X is chlorine or bromine, both values of X being identical; and Q is phenylamino, dichlorophenylamino, monochlorophenylamino, lower-alkylphenylamino, monofluorophenylamino, monobromophenylamino, benzylamino, together with (B) an inert carrier especially adapting the composition as a whole to application to areas to be cleared of undesirable plant growth.

3,963,481

PROCESS FOR COOLING SINTER ON THE STRAND

Robert E. Powers, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 555,061
Int. Cl.² C22B 1/24, 1/08
U.S. Cl. 75—5 6 Claims



1. A process for preparing a sintered product comprising the steps:

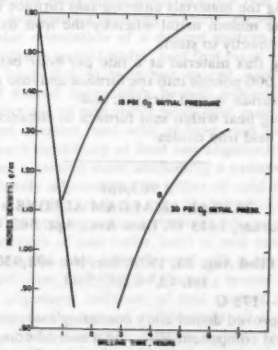
a. continuously depositing on gas-permeable moving sintering conveyor units a hearth layer of screened sinter;
b. continuously depositing on said hearth layer a layer of material to be sintered mixed with a fuel;
c. igniting said fuel;
d. inducing downdraft burning of said fuel in a burning zone whereby said material becomes progressively sintered;
e. removing a portion of the material after it has become sintered;
f. thereafter passing a gas upwardly through the remaining indurating material to cool the same; and
g. conducting said gas after it has passed through the material into said burning zone.

3,963,482

LARGE SIZE ALUMINUM PARTICLE CONTAINING ALUMINUM OXIDE THEREIN

Thomas J. Kondis, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 307,334, Nov. 17, 1972, Pat. No. 3,890,166. This application May 5, 1975, Ser. No. 574,370
Int. Cl.² B22F 9/00
U.S. Cl. 75—0.5 R 3 Claims



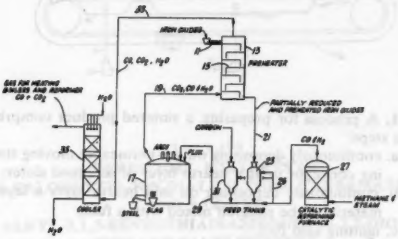
1. A method of producing improved aluminum particulate suitable for powder metallurgy applications comprising:

a. milling particulate aluminum in an inert liquid and in the presence of a predetermined amount of oxygen thereby comminuting the aluminum into finer particles while oxidizing the new surfaces of such finer particles; and
b. further milling said oxidized aluminum particles after the supply of oxygen is exhausted to cause the particles to weld together thereby forming an aluminum particle having aluminum oxide dispersed therein.

3,963,483
DIRECT REDUCTION STEELMAKING PROCESS

Walther H. Mathesius, Beaver, and Somerled Macdonald, Sewickley, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 233,446, March 10, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,272
Int. Cl.² C21C 5/52; C21B 13/02
U.S. Cl. 75—11 18 Claims



1. A direct reduction process for making steel comprising the steps of:
- a. moving iron oxides into a first container at a flow rate per hour between 13,000 and 140,000 pounds;
- b. flowing hot gases into said container and into contact with said iron oxides;
- c. partially reducing said iron oxides in said first container;
- d. moving the partially reduced iron oxides into a second container;
- e. flowing carbon monoxide and hydrogen into said second container and into contact with said partially reduced iron oxides;
- f. flowing the partially reduced iron oxides and fine particulate carbon having a mesh size less than 10 at a flow rate between 4,000 and 50,000 pounds per hour and the carbon monoxide and hydrogen into a furnace wherein there is a pool of molten metal that is at a temperature between 2750° and 3100° F;
- g. bringing the materials entering said furnace into contact with the molten metal whereby the iron oxides are reduced directly to steel;
- h. flowing flux material at a rate per hour between 1,000 and 11,000 pounds into the furnace and into contact with the materials in said furnace; and
- i. providing heat within said furnace to enhance the reduction of said iron oxides.

3,963,484
DENTAL AMALGAM ALLOYS

Nikhil K. Sarkar, 1415 W. Lunt Ave., Apt. 503, Chicago, Ill. 60626

Filed Aug. 20, 1974, Ser. No. 498,930
Int. Cl.² C22C 5/08
U.S. Cl. 75—173 C 18 Claims

1. An improved dental alloy consisting essentially of a mixture of a first component alloy and a second component alloy suitable for amalgamation with mercury to form an improved dental amalgam,
- a. said first component alloy consisting essentially of at least 65% silver, an operable amount of tin up to and including 29% maximum, an operable amount of copper up to and including 6% maximum, and an operable amount of zinc up to and including 2% maximum, by weight of said first component alloy;
- b. said second component alloy consisting essentially of a copper-silver alloy containing more than 50.00% copper;
- c. said first component alloy comprising about 70 to 90% by weight of said alloy mixture and said second component alloy comprising about 10 to 30% by weight of said alloy mixture.

3,963,485
METHOD OF PRODUCING SINTERED TITANIUM BASE ARTICLES

Edward Louis Thellmann, Walton Hills, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 249,193, May 1, 1972, abandoned. This application July 5, 1973, Ser. No. 376,393
Int. Cl.² B22F 1/02
U.S. Cl. 75—212 15 Claims

1. The method of producing a sintered titanium base article comprising the steps of:
- coating particles of an aluminum base pre-alloyed metal with an iron containing compound capable of yielding elemental iron particles;
- converting said iron containing compound to elemental iron particles at least some of which coat said pre-alloyed metal particles;
- mixing said pre-alloyed metal particles and iron particles with titanium base particles;
- compacting the resultant mixture into an article having the desired configuration;
- heating said formed article under vacuum conditions to a temperature sufficient to cause the constituent particle thereof to diffuse together;
- and cooling said article to produce a solidified, sintered article.

9. A method of producing a sintered titanium base article comprising the steps of:
- coating a plurality of carrier metal particles with an iron containing compound which is capable of being converted to finely divided particles of elemental iron;
- mixing said coated carrier metal particles with titanium base particles;
- compacting the resultant mixture into an article having the desired configuration;
- heating said article under vacuum conditions to a temperature sufficient to convert said iron containing compound to elemental iron particles and cause the constituent materials of said article to diffuse together;
- and cooling said article to produce a sintered article.

15. A method of producing a sintered titanium base article comprising the steps of:
- coating a plurality of metal particles with an iron containing compound which is capable of being converted to finely divided particles of elemental iron;
- mixing said coated metal particles with titanium base particles; and
- forming the resultant mixture into a compacted article having the desired configuration by the application of suitable pressure at a suitable temperature.

3,963,486
ELECTROPHOTOGRAPHIC IMAGING PROCESS EMPLOYING EPOXY-ESTER CONTAINING LIQUID DEVELOPER

Yasuo Tamai; Hajime Miyatuka, and Satoru Honjo, all of Tokyo, Japan, assignors to Rank Xerox Ltd., London, England

Division of Ser. No. 362,598, May 21, 1973, Pat. No. 3,907,693. This application Mar. 26, 1975, Ser. No. 562,298
Int. Cl.² G03G 13/10
U.S. Cl. 96—1 LY 4 Claims

1. An electrophotographic imaging process comprising charging a photoconductive member, selectively exposing said member to imagewise radiation to which it is sensitive, and developing said member with a liquid developer, said developer consisting essentially of an insulating liquid carrier, a pigment, and a resin mixture, said resin comprising epoxy-ester in a range of from 5 to 70% by weight of the resin and the remainder of the resin mixture is selected from the group

consisting of alkyd, resin-modified alkyd, phenol-modified alkyd, styrene-modified alkyd, rosin-modified formaldehyde and polyamide resins.

3,963,487

ELECTROPHOTOGRAPHIC PROCESS USING SEPARATE PHOTOCONDUCTIVE ELEMENTS

Seiji Matsumoto, and Isoji Takahashi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation-in-part of Ser. No. 207,810, Dec. 14, 1971, abandoned. This application Mar. 31, 1975, Ser. No. 563,498

Claims priority, application Japan, Dec. 14, 1970, 45-111579

Int. Cl.² G03G 13/04, 13/06, 13/22

U.S. Cl. 96—1 R 6 Claims

1. An electrographic process comprising (1) arranging (*a*) a main photoconductive layer disposed on a conductive base, on the surface of which a charge is uniformly provided, and (*b*) an auxiliary photoconductive layer, disposed on a light transmissive conductive layer, the total percent transmittance of the auxiliary photoconductive layer and the light transmissive conductive layer being 1–80%, on the surface of which auxiliary photoconductive layer is provided uniform charge opposite to that on said main photoconductive layer, to face each other across a small distance of about 0.1 to about 5 mm, (2) simultaneously forming, by image exposure to the same original from the back of said auxiliary photoconductive layer, electrostatic latent images on both said layers where the product of relative sensitivity ratio and amount of exposure ratio of said main photoconductive layer is 2 to 1000 times greater or less than the product of relative sensitivity ratio and amount of exposure ratio of said auxiliary photoconductive layer, and (3) thereafter supplying a developer between said layers while still facing each other for developing the latent image on said main photoconductive layer, the developed image reproducing gradations in tone of the original due to the latent image on said auxiliary photoconductive layer.

3,963,488

CONTRAST OF ELECTROSTATIC LATENT IMAGES WITH A LIGHT FLOODING STEP

Anatoli Brushenko, Elmhurst, Ill., assignor to GAF Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,627

Int. Cl.² G03G 13/14

U.S. Cl. 96—1 R 11 Claims

1. In a method for the contrast enhancement of an electrostatic latent image on a dielectric surface which comprises: positioning a photoconductive member adjacent said dielectric surface in a manner forming an air gap therebetween, applying an electrical potential between said photoconductive member and said dielectric surface, irradiating selected portions of said photoconductive member while excluding other portions of the photoconductive member from said irradiation, whereby electric charge is caused to form on selected portions of said dielectric surface corresponding to said irradiated photoconductive member portions as a result of charge transfer between said photoconductive member and said dielectric when the voltage drop across said air gap bounded by facing surfaces of said photoconductive member and said dielectric exceeds a predetermined minimum value, said electrical potential being applied as a plurality of discrete pulses of similar polarity, said pulses being of a duration such that said voltage drop across said air gap will exceed said predetermined minimum value in the selected irradiated portions of said photoconductor and will be below said predetermined minimum value in said excluded portions thereof, said pulses of electrical potential being separated by time periods in which said applied electrical potential is essentially zero, said time periods having an average duration of at least the average duration of said applied pulses so that the relative density of electric charge in said selected portions of the dielectric surface is increased by said plurality of pulses over any electric charge density in the non-irradiated portions thereof, the improvement comprising: grounding and uniformly irradiating said photoconductive member during each said time period of essentially zero applied potential which separate said pulses, whereby the intensity and contrast of the electrostatic latent image thus formed is increased, said uniform irradiation being of greater intensity than said irradiation of the selected portions.

3,963,489

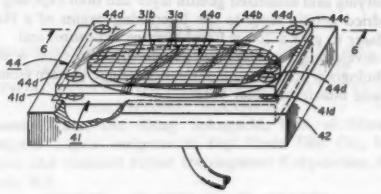
METHOD OF PRECISELY ALIGNING PATTERN-DEFINING MASKS

Kon Ho Cho, West Windsor, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,506

Int. Cl.² H01L 21/312

U.S. Cl. 96—27 R 6 Claims



4. A method of producing precisely aligned patterns on opposite sides of an opaque semiconductor wafer comprising the steps of:

applying a resist coating on each of said sides of said wafer;

bonding a first mask temporarily to a first one of said sides with a low-melting bonding material so as to define a particular orientation of a desired pattern on said first mask relative to said wafer, said first mask being dimensioned such that at least two spaced peripheral areas thereof extend appreciably beyond adjacent peripheral edge portions of said wafer when said mask is properly mounted thereon, and with at least said two extended areas each containing at least one alignment indicium;

positioning a second mask containing a pattern thereon at least closely adjacent to the other of said sides of said wafer such that at least two spaced peripheral areas thereof extend appreciably beyond adjacent peripheral edge portions of said wafer, each of said extended areas of said second mask being formed with at least one alignment indicium, and with the resulting spaced relationship of the alignment indicium of said second mask corresponding to the spaced relationship of the alignment indicia of said first mask, thereby causing the pattern of said second mask to be oriented into precise registration with the pattern of said first mask;

exposing each said resist coating to a light source through the patterns of said masks so as to define desired patterns thereon in mutual alignment; and

removing said masks from said substrate, said first mask being removed by at least softening said low-melting bonding material

removing the exposed chip separation grid pattern portion of said resist coating in preparation for any further circuit processing of said wafer, and the sub-dividing thereof by an.

3,963,490

DYE SENSITIZED DICHROMATED GELATIN HOLOGRAPHIC MATERIAL

Andrejs Graube, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 25, 1974, Ser. No. 509,201
Int. Cl.² G03C 1/10, 1/66
U.S. Cl. 96—27 H 1 Claim

1. A method for increasing the spectral sensitivity of a dichromated gelatin-based hologram which comprises the steps of

a. preparing an aqueous solution of gelatin and ammonium dichromate;

b. casting said solution onto a glass substrate to form a substrate having a radiation sensitive dichromated gelatin layer;

c. exposing said layered substrate to room light to preharden said gelatin layer;

d. sensitizing said gelatin layer by immersing said layered substrate into a solution containing (1) a spectrally sensitive acid fast violet dye selected from the group consisting of the thiazine and triphenylmethane dyes and, (2) ammonium dichromate;

e. drying said sensitized gelatin layer and then exposing said dried gelatin layer to the interfering beams of a He-Ne laser to give a 200 mJ/cm² average exposure; and

f. developing said exposed gelatin layer to form a phase hologram containing a permanent fringe pattern from the said interfering laser beams.

3,963,491

IMAGING METHOD

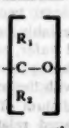
Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 27, 1974, Ser. No. 483,730
Int. Cl.² G03C 5/04, 5/24
U.S. Cl. 96—27 R 17 Claims

1. An imaging method which comprises exposing to activating radiation in an imagewise manner a film comprising:

a. a matrix polymer as the principal ingredient;

b. a degradable polymeric composition containing segments characterized by the formula:



wherein R_1 is hydrogen or methyl and R_2 is hydrogen, an alkyl radical of 1 to 6 carbon atoms, a chlorinated or fluorinated aliphatic radical of 1 to 6 carbon atoms or a cyano substituted radical of 1 to 5 carbon atoms provided that when R_1 is methyl, R_2 is also methyl; and

c. a photo-oxidant which upon activation is capable of abstracting one or more electrons from one or more oxygen atoms of said degradable polymeric composition, thereby causing the degradable polymer to break down into segments of greatly reduced molecular weight and thereby altering the relationship between the matrix polymer and degradable polymer to cause a change in the optical density in the exposed areas and provide a visible image corresponding to the exposed areas.

3,963,492

METHOD FOR PROCESSING SILVER DYE BLEACH MATERIALS

Max Marthaler; Matthias Schellenberg; Herbert Mollet, and Christoph Chylewski, all of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 1, 1974, Ser. No. 510,967
Claims priority, application Switzerland, Oct. 12, 1973, 14531/73
Int. Cl.² G03C 7/00
U.S. Cl. 96—53 10 Claims

1. Method for processing silver dye bleach materials, including the following process measures

1. silver developing,
2. dye bleaching and silver bleaching,
3. silver fixing and
4. soaking,

which method comprises using treatment baths corresponding to the treatment stages (1) to (4), and following the sequence (1) to (4), a bleaching bath (2) being used, for the combined dye bleaching and silver bleaching, which contains

a. a strong acid,

b. a water-soluble iodide,

c. as a water-soluble oxidising agent a water-soluble organic nitro compound,

d. as an anti-oxidant a water-soluble mercapto compound and

e. as a dye bleach catalyst, in an amount of 0.5 to 5 gram per libre, a pyrazine or quinoxaline compound which is water-soluble both in an alkaline and in an acid medium and has an absorption maximum of less than 450 mm,

and that the entire processing, from entry into the first bath (1) to leaving the last bath (4) takes place at temperatures from 20° to 90°C.

3,963,493

DIRECT-POSITIVE SILVER HALIDE EMULSION FOGGED TO LOW LEVEL AND THE USE THEREOF IN ENERGETIC-SURFACE DEVELOPMENT

Willy Joseph Vanassche, Aartselaar; Herman Alberik Pattyn, Kapellen, and Hendrik Alfons Borginon, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Dec. 27, 1972, Ser. No. 318,989
Claims priority, application United Kingdom, Feb. 18, 1972, 7742/72
Int. Cl.² G03C 5/24, 1/28
U.S. Cl. 96—64 34 Claims

1. A direct-positive silver halide emulsion for the production of direct-positive images having a satisfactory density comprising fogged silver halide grains containing electron-traps selected from the group consisting of

a. silver halide grains having adsorbed to the surface thereof one or more electron-accepting compounds having an anodic polarographic half-wave potential and a cathodic polarographic half-wave potential which when added together give a positive sum; and

b. silver halide grains having, in their interior, centers promoting the deposition of photolytic silver,

wherein the silver halide grains have been fogged to such an extent that a test portion of the silver halide emulsion when coated on a support at a coverage of 0.50 to 5.50 g of silver per sq.m., gives a density of less than 0.50 upon processing, without exposure, for 6 minutes at 20°C in a developer of the following composition:

water (52°C.)	500	ml
N-methyl-p-aminophenolsulphate	2.5	g
hydroquinone	2.5	g
anhydrous sodium sulphite	30	g
sodium metaborate	10	g
potassium bromide	0.5	g
water to make	1	liter

and an identical test portion thereof, when coated in an identical way gives a density of at least twice the value of the density of the first test portion and a density of at least 0.50 upon processing, without exposure, for 3 minutes at 20°C. in a developer of the following composition:

hydroquinone	15	g
1-phenyl-3-pyrazolidinone	1	g
trisodium salt of ethylene diamine tetraacetic acid	1	g
anhydrous sodium carbonate	30	g
anhydrous sodium sulphite	70	g
40% aqueous sodium hydroxide	16	ml
water to make	1	liter
	(pH :	11).

25. A process of forming direct-positive images having a satisfactory density by imagewise exposure of an emulsion comprising fogged silver halide grains containing electron-traps selected from the group consisting of

a. silver halide grains having adsorbed to the surface thereof one or more electron-accepting compounds having an anodic polarographic half-wave potential and a cathodic polarographic half-wave potential which when added together give a positive sum; and

b. silver halide grains having, in their interior, centers promoting the deposition of photolytic silver, wherein the silver halide grains have been fogged to such an extent that a test portion of the silver halide emulsion when coated on a support at a coverage of 0.50 to 5.50 g of silver per sq.m., gives a density of less than 0.50 upon processing, without exposure, for 6 minutes at 20°C. in a developer (I) of the following composition:

water (52°C.)	500	ml
N-methyl-p-aminophenolsulphate	2.5	g
hydroquinone	2.5	g
anhydrous sodium sulphite	30	g
sodium metaborate	10	g
potassium bromide	0.5	g
water to make	1	liter

and an identical test portion thereof, when coated in an identical way gives a density of at least twice the value of the density of the first test portion and a density of at least 0.50 upon processing, without exposure, for 3 minutes at 20°C. in a developer (II) of the following composition:

hydroquinone	15	g
1-phenyl-3-pyrazolidinone	1	g
trisodium salt of ethylene diamine tetraacetic acid	1	g
anhydrous sodium carbonate	30	g
anhydrous sodium sulphite	70	g
40% aqueous sodium hydroxide	16	ml
water to make	1	liter
	(pH :	11)

and subsequent development in said developer (II) in the absence of a silver halide fogging agent and without giving a light flash during development.

3,963,494

PHOTOGRAPHIC MULTILAYER DIRECT-POSITIVE SILVER HALIDE ELEMENT

Raymond Leopold Florens, Edegem, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jan. 11, 1974, Ser. No. 432,532

Claims priority, application United Kingdom, Jan. 25, 1973, 3903/73

Int. Cl.² G03C *1/76, 5/24, 1/28*

U.S. Cl. 96—69 **14 Claims**

1. A photographic multilayer direct-positive silver halide element comprising a support, at least two direct-positive silver halide emulsion layers each containing fogged silver halide grains, wherein the undermost and uppermost emulsion layers of the said direct-positive silver halide emulsion layers comprise at least one non-spectrally sensitizing electron-acceptor, and said uppermost emulsion layer of the said direct-positive silver halide emulsion layers comprise at least one spectrally sensitizing electron-acceptor.

9. A photographic element according to claim 8, wherein the uppermost emulsion layer also comprises the same non-spectrally sensitizing electron acceptor as present in the undermost emulsion layer.

3,963,495

IMAGE-RECEIVING ELEMENT FOR SILVER SALT DIFFUSION TRANSFER WITH LAYER OF MONOACRYLATES OR MONOMETHACRYLATES OF POLYHYDRIC ALCOHOLS

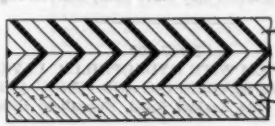
Kazunobu Kato, and Shinji Sakaguchi, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan and National Patent Development Corporation, New York, N.Y.

Filed Mar. 20, 1974, Ser. No. 453,104

Claims priority, application Japan, Mar. 20, 1973, 48-31355

Int. Cl.² G03C *1/48, 5/54;* **B27K** *3/15;* **B41M** *1/18*

U.S. Cl. 96—76 R **14 Claims**



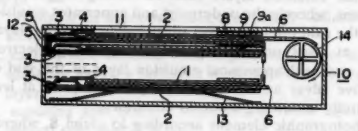
1. An image-receiving material for a silver salt diffusion transfer process comprising (1) a support, (2) on said support a polymer layer containing an imido, mercapto or iodine containing diffusible compound which is a diffusion transfer silver image stabilizer, which can change the property of silver image formed in a binder layer containing silver deposition nuclei, and (3) an alkali permeable and hydrophilic binder layer containing silver deposition nuclei on said polymer layer, said polymer layer comprising at least one water insoluble, alkali permeable hydrophilic polymer selected from the group consisting of homopolymers, copolymers and graft polymers of monoacrylates of polyhydric alcohols and homopolymers, copolymers and graft polymers of monomethacrylates of polyhydric alcohols, and the binder of the binder layer comprising an alkali permeable hydrophilic polymer or an alkali permeable hydrophilic inorganic colloid.

3,963,496

AUTO-PROCESS FILM UNIT WITH REMOVABLE FOLDED SHEET BETWEEN NEGATIVE AND POSITIVE ELEMENTS

Masayuki Arisaka, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 18, 1974, Ser. No. 489,652
Claims priority, application Japan, Aug. 3, 1973, 48-87729
Int. Cl.² G03C 1/48; G03B 19/10; G03D 9/02
U.S. Cl. 96—76 C 6 Claims



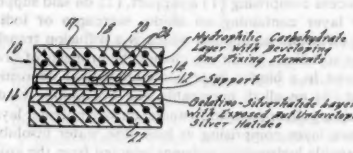
1. In a film unit which comprises a photosensitive sheet, an underlying positive image sheet, and a breakable container at the leading end of said unit in terms of the direction of unit movement during processing and holding a photographic processing solution, and which provides a positive print upon exposure of said photosensitive sheet, and transfer of the film unit forwardly during such movement through pressure means which cause said container to be broken open and processing solution to be spread rearwardly of said pressure means in a thin layer between said photosensitive sheet and said positive image sheet, the improvement wherein; said positive image sheet comprises adhesive portions for bonding thereof to said photosensitive sheet, said photosensitive sheet and said positive image sheet are each attached along one edge to said container, and are separated from one another prior to exposure of said photosensitive sheet by a removable, lightproof, folded, anti-adhesive continous strip including a doubled portion positioned therebetween, each layer of which having dimensions matching those of the light-sensitive portions of said film unit and respectively contacting said photosensitive sheet and said positive image sheet and being removable after exposure of said photosensitive sheet, whereby said photosensitive sheet and said positive image sheet may be then bonded together during passage through a processing pressure means, and processing solution may move easily therethrough.

3,963,497

X-RAY FILM WITH HYDROPHILLIC LAYER CONTAINING DEVELOPING AND FIXING AGENTS

Carl M. Kosti, 704 Foxhall Road, Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 357,998, May 7, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,902
Int. Cl.² G03C 1/48, 5/38
U.S. Cl. 96—76 R 10 Claims


Hydrophilic Carbohydrate Layer With Developing And Fixing Elements
Support
Gelatino-Silverhalide Layer With Exposed And Undeveloped Silver Halides

1. In a film which comprises an x-ray sensitive, acidic or neutral, silver halide containing emulsion layer on a support the improvement which comprises:

an integral alkaline, hydrophilic, water soluble layer in said film, said hydrophilic layer including both developing and fixing agents homogeneously distributed therethrough.

3,963,498

SILVER HALIDE ELEMENT CONTAINING AN ORGANIC SEMICONDUCTOR

Donald J. Trevoy, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

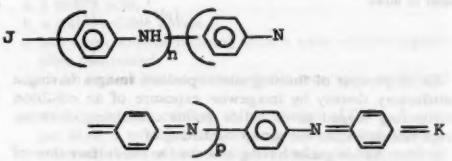
Continuation-in-part of Ser. No. 212,640, Dec. 27, 1971, abandoned, and a continuation-in-part of Ser. No. 455,705, March 28, 1974, abandoned. This application June 25, 1974, Ser. No. 482,960
Int. Cl.² G03C 1/78, 1/96
U.S. Cl. 96—87 A 9 Claims

1. A semiconductor element comprising a support having thereon a silver halide emulsion layer and a layer comprising a semiconductor composition comprising a binder and a semiconductor having organic solvent solubility and represented by the expression:

$$D[A]_e$$

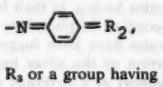
wherein:

D represents a moiety having the structure:

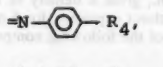


in which:

J represents either R_1 or a group having the formula



K represents either R_4 or a group having the formula



R_1 and R_4 are each selected from the group consisting of a hydrogen atom, a hydroxy radical, a lower alkyl radical, a lower alkoxy radical, an amino radical, an aryl radical, an acyl radical, a carboxylate radical, a thio radical, a nitrate radical, a sulfonate radical, a halogen atom and a cyano radical;

R_2 and R_3 each represent (1) an uncharged radical selected from the group consisting of oxo, imino and thioxo radicals or (2) a charged radical selected from the group consisting of alkoxonium, iminium, and sulfonium, radicals; and

n and *p* are each integers having the following combinations of values:

when J represents		
and K represents R_4,	p = 0	n = 0, 1, 2, 3, 4, 5
	p = 1	n = 0, 1, 2, 3
	p = 2	n = 0, 1
when J represents R_1 and K represents R_4,	p = 0	n = 0, 1, 2, 3, 4, 5, 6
	p = 1	n = 0, 1, 2, 3, 4
	p = 2	n = 0, 1, 2
	p = 3	n = 0
when J represents R_1 and K represents	p = 0	n = 0, 1, 2, 3, 4, 5
	p = 1	n = 0, 1, 2, 3
	p = 2	n = 0, 1;

A is an acid when R_2 and R_3 are each an uncharged radical and when R_2 and/or R_3 is a charged radical, A is an anion derived from an acid; and

q represents the number of A moieties associated with each D and is a positive integer that is greater than 0 and less than or equal to the number of amine groups in the D moiety.

3,963,499

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Keisuke Shiba; Hideki Naito; Nobuo Yamamoto, and Masakazu Yoneyama, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

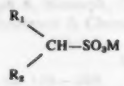
Filed Oct. 15, 1974, Ser. No. 514,712

Claims priority, application Japan, Oct. 12, 1973, 48-114436

Int. Cl.² G03C *1/40, 1/38*

U.S. Cl. 96—100 **9 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer with the light-sensitive material containing in a hydrophilic colloid layer thereon at least two surface active agents selected from the compounds represented by the general formula (I)



(I)

and the general formula (II)

$$R_3 - SO_3M \qquad \text{(II)}$$

wherein, R_1 and R_2 each represents an aliphatic residue with the sum of the carbon atoms contained in R_1 and R_2 ranging from about 8 to 32; R_3 represents an aliphatic residue having about 8 and 20 carbon atoms; M represents a cation or a cationic group capable of forming a salt with a sulfonic acid; and compounds (I) are secondary alkane sulfonates and compounds (II) are primary alkane sulfonates.

3,963,500

SEMICONDUCTOR WAFER CORROSION PROTECTION SOLUTION

Dervin L. Flowers, Scottsdale, and V. Louise Rice, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 428,499, Dec. 26, 1973. This application Feb. 3, 1975, Ser. No. 546,225

Int. Cl.² C09D *5/08*

U.S. Cl. 106—14 **1 Claim**

1. A coating solution consisting essentially of:

a. 1 to 30 grams per liter of phosphorous pentoxide;

b. 1 to 60 grams per liter of boric anhydride;

c. 0.005 to 5.0 grams per liter of a material selected from the group consisting of gold, platinum, palladium and rhodium salts and oxides;

d. the balance, a solvent selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, and isobutyl alcohol, ethylene glycol, and tetrahydro furfuryl alcohol.

3,963,501

PROCESS FOR PREPARING ANTI-MIST COMPOUNDS FOR PRINTING INKS AND PROCESS FOR PREPARING PRINTING INKS CONTAINING SAME

Norbert G. Zalesky, Cornwells Heights, Pa., assignor to Garlock Inc., Palmyra, N.Y.

Filed July 30, 1974, Ser. No. 493,097

Int. Cl.² C09D *11/00, 11/06, 11/10*

U.S. Cl. 106—20 **12 Claims**

1. A process for producing an anti-mist compound adapted for addition to a printing ink to inhibit the misting of said printing ink on a printing press, which comprises:

mixing chrysotile particles having an average size exceeding about 0.1 inch with an organic printing ink vehicle to provide a mixture in which said particles are wetted with said vehicle, and

milling said mixture simultaneously to grind said particles into micro-fibrous particles having a particle size of 10 microns or less and to disperse said micro-fibrous particles uniformly throughout said vehicle to provide an anti-mist compound including at least 25% by weight of chrysotile.

3,963,502

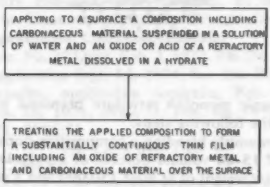
COMPOSITION FOR APPLICATION TO DIE CAVITY SURFACE

Alexander S. Borbely, and Jon A. Bereman, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Division of Ser. No. 328,924, Feb. 2, 1973, Pat. No. 3,865,608. This application Sept. 27, 1974, Ser. No. 509,811

Int. Cl.² B28B *7/36*

U.S. Cl. 106—38.28 **6 Claims**


APPLYING TO A SURFACE A COMPOSITION INCLUDING CARBONACEOUS MATERIAL SUSPENDED IN A SOLUTION OF WATER AND AN OXIDE OR ACID OF A REFRACTORY METAL DISSOLVED IN A HYDRATE
TREATING THE APPLIED COMPOSITION TO FORM A SUBSTANTIALLY CONTINUOUS THIN FILM INCLUDING AN OXIDE OF REFRACTORY METAL AND CARBONACEOUS MATERIAL OVER THE SURFACE

1. A composition including carbon material suspended in a solution of water and an oxide or acid of a refractory metal dissolved in a hydroxide.

3. The composition of claim 1, wherein the carbon material is graphite, the oxide of the refractory metal is an oxide of tungsten and the hydroxide in which the oxide of tungsten is dissolved is selected from ammonium hydroxide, sodium hydroxide, and potassium hydroxide.

3,963,503

METHOD OF MAKING GLASS PRODUCTS, NOVEL GLASS MIX AND NOVEL GLASS PRODUCT

John D. Mackenzie, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 268,971, July 5, 1972, Pat. No. 3,900,303. This application Mar. 14, 1975, Ser. No. 558,510

Int. Cl.² C03C *3/00, 1/00;* C04B *2 1/00*

U.S. Cl. 106—40 V **8 Claims**

1. An improved heat treatable glass mix comprising:

used-container glass having the following approximate concentration of foreign inclusions mixed therewith:

Inclusions	% by wt. in glass
Fe	0.1 to 3
Sn	0.1 to 2
Al	0.1 to 2
Other metals	0.1 to 1
Cellulosics	0.1 to 1
Other organics	0.1 to 1

said used-container glass having an average reflectance of between about 5% and about 95%; and

a carbonate foaming agent mixed therewith in a concentration of about 0.5 to about 10 percent by weight of the mix, said foaming agent being activatable upon heating said used-container glass to a temperature and pressure within a range sufficient to sinter and soften said glass but insufficient to melt said glass.

3,963,504

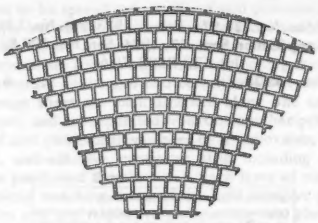
POROUS CERAMIC STRUCTURE

Christian Bent Lundsager, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 269,204, July 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 83,020, Oct. 22, 1970, abandoned. This application Dec. 24, 1974, Ser. No. 536,079

Int. Cl.[2] C04B *21/04*; B01J *35/00*; C04B *21/06*, *35/00*

U.S. Cl. 106—41 3 Claims



1. A ceramic monolith structure prepared by a process comprising the following steps:

a. homogeneously blending a composition consisting essentially of 15–80 volume percent of a polyolefin having a molecular weight of at least 150,000 and a standard load melt index of substantially zero, 5–67 volume percent of a ceramic filler, 15–80 volume percent of a plasticizer; selected from a group consisting of mineral oils, glycols, triethyl phosphate, polyvinyl alcohol, and polyvinyl pyrrolidone,

b. heating said composition to about 125° to 175°C., molding to form a plastic sheet and impressing ribs thereon,

c. rolling said plastic sheet so that said ribs contact said sheet, heating to about 150°–250°C. to fuse the contacting areas together thermoplastically,

d. extracting the plasticizer with water or an organic solvent,

e. removing said polyolefin by heating to 240°–700°C. to form a porous ceramic structure and burn off the polyolefin and,

f. firing said porous ceramic structure at a temperature of about 1300°–1450°C. for a period of time sufficient to sinter said porous ceramic structure, characterized by:

1. uniform channels of an essentially rectangular cross section laterally through the length of the monolith, varying in size from 0.025 to 0.20 inches; said channels being arranged in a pattern so that in the first direction a given channel adjoins the next channel separated by a common wall, and in a second direction, perpendicular to the first direction, a given channel adjoins one or more of the other channels sharing one wall with the adjacent other channel or channels,

2. a coefficient of thermal expansion of 1.2 to 3.0×10^{-6} per degree Fahrenheit,

3. a porosity of 20–30 percent,

4. A density of about 0.2 to 0.8 grams per cubic centimeter,

5. an average pore size of 4 to 8 microns.

3,963,505

LEAD-ZINC-BORON SEALING GLASS COMPOSITIONS

Maurice E. Dumesnil, Palo Alto, and Ulrich Schreier, San Mateo, both of Calif., assignors to Technology Glass Corporation, Sunnyvale, Calif.

Filed Nov. 23, 1973, Ser. No. 418,247

Int. Cl.[2] C03C *3/10*, *3/14*, *3/30*

U.S. Cl. 106—47 R 5 Claims

1. A sealing glass composition comprising a mixture of a finely divided solder sealing glass selected from the group consisting of lead boron glasses and lead zinc boron glasses in which the zinc oxide:lead oxide mol ratio is below 1:2 and a finely divided oxygen containing zinc material selected from the group consisting of zinc silicate, zinc zirconium silicate, zinc oxide, zinc aluminate, zinc zirconate, zinc stannate, zinc zirconium aluminum silicate and mixtures thereof, the zinc material being present in amount in the range 3 to 30% by weight of the total mixture.

3,963,506

FIRED CONSTRUCTION SHAPES AND PROCESS AND BINDER THEREFOR

Thomas Clifford Shutt, Arvada, and Howard Campbell, Golden, both of Colo., assignors to Glass Container Manufacturers Institute, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 303,188, Nov. 2, 1972, abandoned. This application May 6, 1974, Ser. No. 468,574

Int. Cl.[2] C04B *35/64*

U.S. Cl. 106—67 10 Claims

1. A process for producing a soda lime glass physically bonded structural product comprising the steps of:

a. forming a moldable, thioxtropic particulate composition of low porosity and high packing density by mixing:

1. particulate inorganic inert aggregate;

2. from 8 to 35 weight per cent finely divided waste soda lime glass whose particles have a size of less than 80 mesh;

3. ball clay in an amount of at least 2 weight per cent and sufficient to render the mixture thioxtropic; and

4. water in an amount not greater than 20 weight per cent to make said mixture moldable, the particle size of said aggregate being greater than the particle size of said finely divided waste soda lime glass and the particle size distribution of said aggregate and said finely divided glass being such that the mixture thereof contains 15 to 35 weight per cent of particles whose size is less than 80 mesh;

b. forming said mixture into a predetermined shape;

c. drying, then firing said shaped mixture at a temperature below 1900°F and sufficient to soften said finely divided soda lime glass and allow it to flow around and physically bond to said particulate aggregate substantially without chemical reaction; and

d. cooling said fired shape.

3,963,507

FOAM-CONTAINING SLURRY TO MAKE POROUS, INORGANIC CONSTRUCTION MATERIAL

Naoya Kuramoto, Hachioji; Hachiro Saito, Hino, and Wataru Yamamoto, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 22, 1974, Ser. No. 472,198
Claims priority, application Japan, May 29, 1973, 48-59313
Int. Cl.² C04B 7/02, 7/353, 15/06
U.S. Cl. 106—86 12 Claims

1. A foam-containing slurry for making porous, inorganic construction material comprising 100 parts by weight of water [I], 35 to 350 parts by weight of hydraulic substance [II] selected from the group consisting of cement, siliceous sand and quicklime and mixtures thereof, and 0.02 to 1.20 parts of foaming agent [III], said foaming agent [III] comprising

1. as the foaming component, 0.05 to 20 parts by weight of water-soluble, low-viscosity cellulose ether of which 2 weight % aqueous solution has a viscosity of 25 to 2,000 centipoises at 20° C.,
2. as the foam stabilizer, 1 part by weight of water-soluble, high-viscosity cellulose ether of which 2 weight % aqueous solution has a viscosity exceeding 2,000 centipoises at 20° C., and
3. as the foaming accelerator, at least 1 part by weight of at least 75% saponified polyvinyl alcohol of which 4 weight % aqueous solution has a viscosity of not higher than 70 centipoises at 20° C.

3,963,508

CALCIUM ALUMINATE CEMENT

Joseph S. Masaryk, Castro Valley, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 18, 1974, Ser. No. 524,903
Int. Cl.² C04B 7/32
U.S. Cl. 106—104 31 Claims

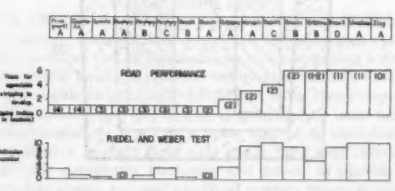
1. Method of making a refractory calcium aluminate cement comprising: (1) admixing (a) from 40 to 60% of a clinker, at least 80% of which is the CA phase, with (b) from 60 to 40% of an alumina which has a specific surface of from 1 to 30 m^2g, an average pore size of from 0.05 to 0.5 microns, and a brain coral morphology; and (2) grinding the clinker and the alumina, after admixing, so that 80% passes a 325 mesh screen, all percentages being by weight.

3,963,509

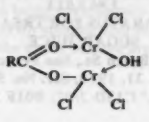
ASPHALT HAVING HIGH ADHESION STRENGTH AND ITS PREPARATION

Tadashi Doi, Osaka; Isao Sekido, Wakayama, and Ryoichi Tamaki, Arita, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 415,982, Nov. 15, 1973, abandoned.
This application Jan. 13, 1975, Ser. No. 540,695
Claims priority, application Japan, Nov. 20, 1972, 47-116448
Int. Cl.² C08L 95/00
U.S. Cl. 106—273 R 3 Claims



1. An asphalt road-paving composition consisting essentially of road-paving aggregate selected from the group consisting of crushed stone and sand, mixed and coated with an asphalt composition consisting essentially of road-paving asphalt and 0.3 to 2% by weight, based on the weight of asphalt, of a monocarboxylic chromic chloride having the formula:



wherein R is alkyl or alkenyl having 1 to 21 carbon atoms.

3,963,510

PROCESS FOR THE PRODUCTION OF TONED CARBON BLACK

Günter Osswald, Grossauheim, and Josef Reus, Freigericht, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Nov. 1, 1974, Ser. No. 520,224
Claims priority, application Germany, Nov. 8, 1973, 2355758
Int. Cl.² C09C 1/48, 1/44
U.S. Cl. 106—289 14 Claims

1. A process for the production of carbon black toned with a lake forming organic dye comprising dispersing the carbon black in an aqueous solution of the dye and the laking agent, mixing the dispersion obtained with stirring with sodium waterglass, completing the laking by adding sodium molybdate, separating the toned carbon black from the liquid phase and drying the toned carbon black.

3,963,511

MODIFICATION OF MINERAL SURFACES

Jean Drummond Swift, Olinda; David Geoffrey Hawthorne, South Oakleigh; Bryan Clarence Loft, Strathmore, and David Henry Solomon, Glen Waverley, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 222,684, Feb. 2, 1972, Pat. No. 3,849,149.
This application Sept. 16, 1974, Ser. No. 506,449
Claims priority, application Australia, Feb. 10, 1971, 3980/71; Feb. 10, 1971, 3982/71; Feb. 10, 1971, 3984/71; Feb. 10, 1971, 3986/71
Int. Cl.² C09C 1/00
U.S. Cl. 106—308 Q 9 Claims

1. A pigment or filler material consisting of a particulate material other than titanium dioxide having a surface coating with a significant number of acidic sites with pKa values of less than 2.8, on which has been adsorbed an organic base which can act as one of a proton acceptor and an electron donor.

3,963,512

MODIFICATION OF MINERAL SURFACES

Jean Drummond Swift, Olinda; David Geoffrey Hawthorne, South Oakleigh; Bryan Clarence Loft, Strathmore, and David Henry Solomon, Glen Waverley, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 222,684, Feb. 1, 1972, Pat. No. 3,849,149.
This application Sept. 16, 1974, Ser. No. 506,448
Claims priority, application Australia, Feb. 10, 1971, 3986/71
Int. Cl.² C09C 1/00
U.S. Cl. 106—308 M 9 Claims

1. A pigment or filler material consisting of a particulate mineral other than titanium dioxide having a surface coating with a significant number of acidic sites with pKa values less than 2.8, and which has been modified by the addition of a polymeric coating formed by in situ acid-catalyzed polymerization of at least one organic monomer, followed by neutral-

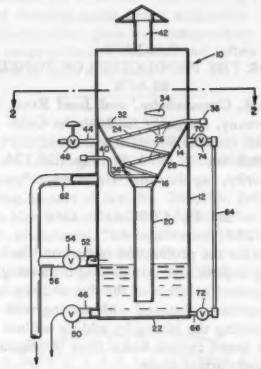
ization of the surface with a base which terminates the polymerization reaction.

3,963,513

PROCESS AND APPARATUS FOR TREATMENT OF CANE SUGAR JUICE

John A. Casey, 1755 Beach St., San Francisco, Calif. 94123

Filed Oct. 21, 1974, Ser. No. 516,341
Int. Cl.² C13D 3/02; B01F 5/00
U.S. Cl. 127—11 8 Claims



1. An apparatus for the chemical treatment of a solution to induce controlled growth of undesirable precipitables in said solution which comprises:

a treating tower having vapor outlet means in an upper portion of said tower;

conical funnel means in an upper portion of said tower communicating with a vertical exit conduit extending to a lower portion of said tower;

spiral tubular feeding means, perforated along its length, nesting in said conical funnel and having inlet and outlet conduit means for receiving and discharging a solution;

means for introducing a feedstock solution tangentially to an upper portion of said conical funnel means at a velocity sufficient to cause said feedstock to flow in a substantially spiral path in said conical funnel from the upper portion thereof to said vertical exit conduit; and

discharging means in a lower portion of said tower for varying the residence time of said feedstock solution.

3,963,514

REMOVAL OF EXCESS METAL FROM THE WELDING SEAM IN THE INTERIOR OF A PIPE

Johann Wassen, Brackwede, Germany, assignor to Mannesmannrohren-Werke AG, Dusseldorf, Germany

Filed Aug. 14, 1974, Ser. No. 497,253
Claims priority, application Germany, Aug. 17, 1973, 2342169
Int. Cl.² B08B 3/04, 9/04, 9/06
U.S. Cl. 134—8 3 Claims

1. Method of removing the wire-like, internal welding seam burr having been severed and lying in the pipe, comprising the steps of

filling the interior of the pipe over its entire length with liquid, adding small particles to the liquid, the particles having dimensions comparable to the thickness of the wire burr for being capable of carrying the burr during any flow of the liquid;

pressurizing the liquid in the pipe; and

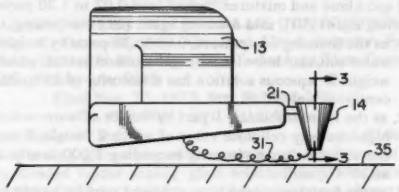
forcing the liquid out of the pipe under high pressure and as a liquid column, whereby the wire-like burr is fluid-dynamically embedded over its entire length in the particles in the liquid and is carried along by the particles and removed from the pipe.

3,963,515

VACUUM CLEANING

Charles W. Haldeman, Concord, and Eugene E. Covert, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 2, 1974, Ser. No. 528,747
Int. Cl.² A47L 5/14
U.S. Cl. 134—21 10 Claims



1. In vacuum cleaning apparatus having a source of vacuum and suction nozzle means having an outlet and an inlet defined by a circumferential wall extending toward a surface to be cleaned for withdrawing debris from a surface to be cleaned the improvement comprising,

vortex generating means adjacent to a portion of said circumferential wall which separates said vortex generating means from said suction nozzle inlet means for producing at least one vortex having a vortex filament flowing from said vortex generating means along and generally parallel to the surface to be cleaned through the gap between the surface to be cleaned and said circumferential wall portion of said inlet for loosening debris that may then be withdrawn from said surface through said nozzle means which is completely outside the space occupied by said vortex generating means.

2. The improvement in accordance with claim 1 wherein said vortex generating means comprises,

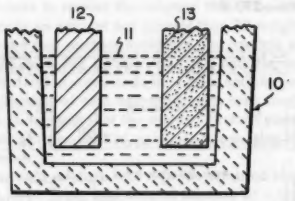
vortex nozzle means for initiating said at least one vortex, and means for supporting said vortex nozzle means for directing a vortex towards the surface to be cleaned.

3,963,516

HIGH ENERGY DENSITY FUSED SALT BATTERY AND CATHODE FOR USE THEREIN

Edward S. Buzzelli, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1974, Ser. No. 446,190
Int. Cl.² H01M 35/02
U.S. Cl. 136—6 LF 6 Claims



1. A fused electrolytic cell comprising a Li-Al anode, a cathode an integral matrix of about 20 to 80% by weight of a porous current collector material and about 80 to 20% by weight of a metal sulfide selected from the group consisting of

antimony sulfide, tungsten disulfide and molybdenum disulfide spaced apart from said anode, and a molten LiCl—KCl electrolyte in contact with said anode and said cathode.

3,963,517
PROCESS FOR THE MANUFACTURE OF LEAD STORAGE BATTERY ELECTRODES AND APPARATUS FOR CARRYING OUT THE PROCESS

Gunnar Eckerbom, Kungalv, and Ove Nilsson, Nol, both of Sweden, assignors to Aktiebolaget Tudor, Stockholm, Sweden

Filed May 30, 1974, Ser. No. 474,675
Claims priority, application Sweden, June 1, 1973, 73077596
Int. Cl.² H01M *39/00*
U.S. Cl. 136—27 **7 Claims**

1. A method for producing active granular material for lead storage battery electrodes which comprises forming a paste from a moistened mixture of lead and lead oxide particles, forcing the resulting paste through a foraminous body, an drying the resulting granular material during free fall.

3,963,518
SOLIDS IONICALLY CONDUCTIVE AT ELEVATED TEMPERATURES

Seymour Senderoff, Fairview Park, and Geoffrey W. Mellors, Strongsville, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,584
Int. Cl.² H01M *4/36*
U.S. Cl. 136—83 T **3 Claims**

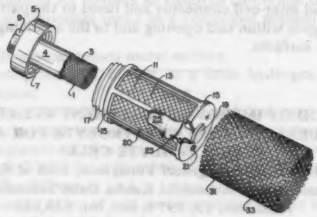
1. A binary composition of copper iodide and an alkali metal cyanide suitable for use in electrochemical devices activatable at temperatures above about 250°C. which composition is ionically conductive in the solid state above such temperature.

3,963,519
METAL/AIR CELL

Hong Po Louie, Brooklyn, N.Y., assignor to Leesona Corporation, Warwick, R.I.

Continuation-in-part of Ser. No. 735,913, June 10, 1968, abandoned. This application Aug. 3, 1971, Ser. No. 168,571
Int. Cl.² H01M *12/06*
U.S. Cl. 136—86 A **18 Claims**

1. A unitary, compact, and completely self-contained cylinder-like metal/air cell of the flashlight type comprising a consumable metal anode, a pressure deformable cathode having a gas-permeable electrolyte impermeable outer face comprising a hydrophobic polymer and an electrocatalytic inner face, said electrocatalytic inner face being spaced in electrically non-conductive contact from said anode, and said cathode substantially completely enclosing said anode to provide a cylinder-like shape, exposed electrical contact means in electrical contact with said anode at one end of said cell and exposed electrical contact means in electrical contact with said cathode at the opposite end of said cell and an electrolyte material between said anode and cathode, said anode and cathode and both said electrical contact means being constructed and arranged to provide an electrolyte-tight seal between said anode, cathode, and electrical contact means, a substantially rigid protective shield having a plurality of perforations therein and being substantially co-extensive with said cathode, and means for spacing said shield from said cathode over substantially the entire surface area of said cathode, said



means including spacer means at opposite ends of said cylinder-like cell constructed and arranged with said protective shield to secure said shield to said cell while providing a space over substantially the entire surface area of said cathode permitting access of air to said cathode through said perforations, said anode includes closure means and said closure means and said spacing means are threadedly engaged.

3,963,520
PRIMARY CELL CORROSION INHIBITOR

Jakob Bauer, Ellwangen-Rotenbach, and Albert Winkler, Ellwangen, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

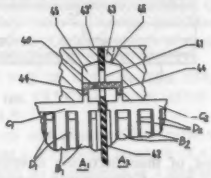
Filed Aug. 6, 1975, Ser. No. 602,394
Int. Cl.² H01M *6/06*
U.S. Cl. 136—107 **9 Claims**

1. A primary cell comprising a negative amalgamated zinc electrode, a positive depolariser electrode and an alkaline electrolyte, a corrosion inhibitor of monocarboxylic acid selected from the group consisting of saturated and unsaturated monocarboxylic acids each having at least two ethanolamide radicals, said inhibitor being present in an amount not exceeding 1 percent based on the weight of the zinc electrode.

3,963,521
LEAKPROOF BONDING OF STORAGE BATTERY COMPONENTS

Otto Jache, Budingen, Hessen, Germany, assignor to Accumulatorenfabrik Sonnenschein GmbH, Germany

Division of Ser. No. 289,862, Sept. 18, 1972, Pat. No. 3,919,371, which is a continuation-in-part of Ser. No. 55,934, July 17, 1970, abandoned. This application Sept. 3, 1975, Ser. No. 609,988
Claims priority, application Germany, July 17, 1969, 1936472
Int. Cl.² H01M *2/26*
U.S. Cl. 136—134 R **3 Claims**



1. In a storage battery the combination of a casing of thermoplastic material having a partition wall dividing the casing

into cell compartments at opposite sides thereof, said partition wall having a transverse opening therethrough, cell groups comprising negative plates and positive plates, each group being electrically connected together by metallic straps, one of said cell groups being positioned in each of said cell compartments, a metallic inter-cell connector electrically connecting adjacent straps of said cell groups and passing through said opening and a one piece molded sealing member of multicellular thermoplastic polymeric material bonded to and confining said inter-cell connector and fused to the partition wall in the region within said opening and to the adjoining areas on opposite surfaces.

3,963,522

METHOD OF IMPROVED TREATMENT RELATING TO THE SURFACE OF THE ELECTROLYTE FOR A SOLID ELECTROLYTE CELL

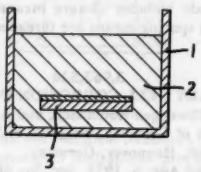
Toyoo Harada, and Shigenori Funayama, both of Sendai, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 13, 1974, Ser. No. 523,522

Claims priority, application Japan, Nov. 16, 1973, 48-129015

Int. Cl.² H01M 6/18

U.S. Cl. 136—153 3 Claims



1. The method of treatment of surfaces of the β-alumina electrolyte for a solid electrolyte cell of Na^+ ion conductive type to lower the faradaic impedance at the electrode-electrolyte interface and to prevent deterioration of such electrolytes during storage, wherein the conductive paint, containing unoxidized metal powder selected from the group consisting of powdered gold, silver and mixtures thereof is coated on the surface of said solid electrolyte, sintered at a temperature in the range 700°C to 900°C, cooled and then further coated by immersion in a fused sodium nitrate salt bath.

3,963,523

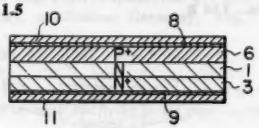
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Yoshimi Tanaka, Kyoto, and Hirotsugu Hattori, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 354,520, April 26, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,240

Int. Cl.² H01L 21/225

U.S. Cl. 148—1.5 4 Claims



1. A method of manufacturing a semiconductor device comprising the steps of depositing a coating of platinum having a thickness of 0.1 to 0.4 μ on at least one surface of a silicon substrate having at least one PN junction formed therein, subjecting said substrate to a first heat treatment for increasing the adhesion strength of the plated platinum layer to the silicon substrate, plating a layer of nickel on said silicon substrate coated with platinum, and then subjecting said plated nickel layer to a second heat treatment at a temperature of 800° to 900°C to cause said platinum to diffuse into said silicon substrate.

3,963,524

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

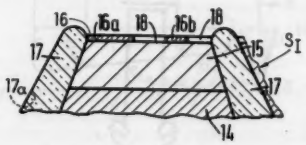
Jüergen Graul, Gruenwald, and Helmuth Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 9, 1975, Ser. No. 594,341

Claims priority, application Germany, July 25, 1974, 2435905

Int. Cl.² H01L 21/265

U.S. Cl. 148—1.5 16 Claims



1. In a process for the production of a semiconductor device wherein a first sub-zone of a silicon substrate is covered with a protective layer of silicon nitride, a second sub-zone of the silicon substrate which is adjacent to said first sub-zone is covered with a protective layer of silicon dioxide, and the silicon substrate surface is subjected to a localized doping process in the presence of the silicon nitride layer so that the dopant junctions thus formed in the silicon substrate reaches the substrate surface at least at points within the first sub-zone; the improvement comprising in that:

after the coating of the silicon nitride layer onto said first sub-zone in its final form, the surface of said second sub-zone is oxidized to form silicon dioxide in such a manner that at least said layer of silicon nitride which is directly adjacent to the silicon substrate surface is retained;

that a select part of said silicon dioxide layer and at least an adjacent part of said siicon nitride layer are then covered with a photo-lacquer mask having at least one window therein leaving at least another part of said silicon dioxide layer uncovered; and

subjecting the resultant structure to localized doping whereby the zone of the silicon substrate covered at least by said other part of the silicon dioxide layer is doped.

3,963,525

METHOD OF PRODUCING A HOT-WORKED TITANIUM PRODUCT

Howard B. Bomberger, Jr., Canfield, and Stanley R. Seagle, Warren, both of Ohio, assignors to RMI Company, Niles, Ohio

Filed Oct. 2, 1974, Ser. No. 511,566

Int. Cl.² C22F 1/18

U.S. Cl. 148—2 14 Claims

1. A method of producing a hot-worked titanium product comprising making up a melting charge of titanium or a titanium-base alloy and a workability-enhancing agent selected from the group consisting of the metals yttrium, a rare earth of atomic number 57 to 71, and combinations thereof, the agent being included in an amount of about 0.001 to 0.10 percent of the weight of the charge and being initially in the form of the metal itself or a compound thereof, melting said charge and casting it to form an ingot, heating said ingot to a temperature of about 1700 to 2300F, and hotworking the ingot to achieve about 30 to 90 percent working in the initial

working step without reheating and without producing significant surface-cracking in the product.

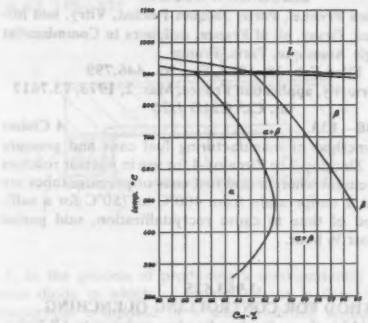
3,963,526
METHOD OF IMPARTING INCREASED DEZINCIFICATION RESISTANCE TO BRASS

Borge Lunn, Rodovre, Denmark, assignor to Aktieselskabet Nordiske Kabel-OG Traadfabriker, Copenhagen, Denmark

Continuation-in-part of Ser. No. 282,864, Aug. 22, 1972, abandoned. This application July 10, 1974, Ser. No. 487,138

Int. Cl.² C22D *1/16*

U.S. Cl. 148—2 **7 Claims**



1. The method of making a brass alloy of the type consisting essentially of primary zinc and from 61 to 66 per cent by weight of copper, suitable for casting, extruding and working and of imparting increased dezincification-resistance to the resulting brass product, said method comprising the steps of initially including in the alloy a small proportion of at least 0.02 per cent by weight of an anti-dezincification agent, and subjecting the resulting brass alloy product to heat treatment in the temperature range of from 450° to 600°C., and continuing the heat treatment at the selected temperature for a period of time sufficient to breakup the beta crystal structure normally formed in the brass alloy into individual units in the alloy and without mutual coherence throughout the alloy product.

3,963,527
CHROMATIZING PROCESS AND COMPOSITION

Karl H. Lindemann, Geinsheim, Germany, assignor to Lindemann & Co. GmbH, Geinsheim, Germany

Filed Jan. 2, 1975, Ser. No. 537,915

Claims priority, application Germany, Jan. 4, 1974, 2400354

Int. Cl.² C23F *7/26*

U.S. Cl. 148—6.2 **2 Claims**

1. In a process of chromatizing zinc articles and zinc electroplated articles, the step which comprises immersing said articles for a period of less than 60 seconds in an aqueous chromatizing bath containing

a. 12.5 g./l. to 37.5 g./l. of sodium dichromate and 12.5 g./l. to 37.5 g./l. of sodium nitrate, said solution being adjusted to a pH of 0.3 by the addition of nitric acid;

b. 25 g./l. to 70 g./l. of formic acid or chloroformic acid or both;

c. 5 ml./l. to 35 ml./l. of a member of the class consisting of glacial acetic acid, concentrated acetic acid, glycolic acid, glycocoll, chloroacetic acid and trifluoroacetic acid and, optionally

d. 5 ml./l. to 12 ml./l. of formaldehyde, calculated on 100% formaldehyde

the pH-value of said bath being maintained at a pH between 1.4 and 2.7.

3,963,528
OXIDATION OF CHROMIUM SURFACES

Walter Fedrowitz, Wappingers Falls, and Rudolf G. Frieser, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,260

Int. Cl.² C23F *7/02*

U.S. Cl. 148—6.14 R **9 Claims**

1. A method for forming an oxidized chromium film on the surface of chromium metal in a controlled manner comprising:

providing a chromium metal surface;

subjecting the said surface to a basic hydrogen peroxide solution;

removing the said surface from said hydrogen peroxide aolurion and immersing said surface in an aqueous permanganate solution maintained at a temperature less than about 100°C for a time less than 10 minutes to form an oxidized film;

the concentration of said permanganate solution is between about 10^{-2} to 10^{-5} molar; and

removing the said surface from said permanganate solution and drying said oxidized chromium film.

3,963,529
SOLDERING FLUX

Eiichi Tsunashima, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 195,865, Nov. 4, 1971, abandoned. This application Feb. 3, 1975, Ser. No. 546,781

Claims priority, application Japan, Dec. 7, 1970, 45-109215

Int. Cl.² B23K *35/34*

U.S. Cl. 148—25 **2 Claims**

1. A soldering flux consisting of rosin oil having an average molecular weight of 120 to 80, which is obtained by cracking rosin at a temperature of 180°C to 250°C and then condensing the distillate.

3,963,530
STAINLESS STEELS COATED WITH BLACK OXIDES

Thomas J. Smollett, and Bozidar Stipanovic, both of Waukegan, Ill., assignors to Coral Chemical Company, Waukegan, Ill.

Continuation-in-part of Ser. No. 431,770, Jan. 8, 1974, Pat. No. 3,915,759. This application Oct. 24, 1974, Ser. No. 517,657

Int. Cl.² C23F *7/04*

U.S. Cl. 148—31.5 **6 Claims**

1. A chromium-containing martensitic or ferritic stainless steel substrate coated with a firmly adherent compact and smooth black oxide coating consisting essentially of a substantial amount of sodium and $(Fe,Cr)_2O_3$ and Fe_3O_4 of a thickness from about 1.5 to about 4.5 microns.

3,963,531
COLD ROLLED, DUCTILE, HIGH STRENGTH STEEL STRIP AND SHEET AND METHOD THEREFOR

James A. Elias, deceased, late of Middletown, Ohio (by June G. Elias, executrix); John R. Newby, and Marvin B. Pierson, both of Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

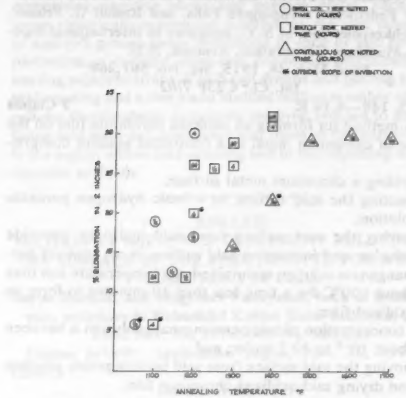
Filed Feb. 28, 1975, Ser. No. 554,158

Int. Cl.² C22C *38/06*, *38/12*

U.S. Cl. 148—31.5 **10 Claims**

1. Cold reduced and annealed low carbon steel strip and sheet stock having a 0.2% yield strength of 45 to 65 ksi or of at least 90 ksi, with an elongation in 2 inches of greater than 10% for at least 90 ksi yield strength and greater than 25% for 45 to 65 ksi yield strength, consisting essentially of, by weight percent, from 0.02% to about 0.10% carbon, about 0.1% to about 0.9% manganese, 0.02% to about 0.18% columbium,

residual phosphorus, sulfur, silicon, oxygen and nitrogen, about 0.01% to about 0.08% aluminum, and balance essentially iron except for incidental impurities, with the columbium being substantially completely combined.


SINGLE SIDE NOTCHED TYPE (SQUARE)
BUTTON SIDE NOTCHED TYPE (SQUARE)
CONTINUOUS (FOR NOTCHED TYPE SPECIMEN)
OUTSIDE SCOPE OF INVENTION
% ELONGATION IN 2 INCHES
ANNEALING TEMPERATURE, °F

3,963,532

Fe, Cr FERRITIC ALLOYS CONTAINING Al AND Nb

Joseph J. Demo, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 30, 1974, Ser. No. 474,541

Int. Cl.² C22C *38/06, 38/26*

U.S. Cl. 148—37 **4 Claims**

1. A ferritic alloy having good as-welded ductility in that it passes the standard guided bend test prescribed by the A.S.M.E. Pressure Vessel Code, 1965, Section 9, Page 59 using a bend test jig having a bend radius to sample thickness ratio of 2 without visible cracking, and good corrosion resistance in that it passes the ASTM A-262-70, 1971 Book of Standards, Practice B test consisting of immersion in boiling 50% H_2SO_4 containing 41.6 gm./liter of ferric sulfate as inhibitor in repeated cycles of 24 hours duration each up to a total exposure of 120 hours, after which the specimens tested exhibited a corrosion rate of less than 40 mils (10.16×10^{-2} cm) per year, consisting essentially of the following percentages by weight:

chromium	25–28
molybdenum	0–1.5
aluminum	0.05–1.0
carbon + nitrogen	0.18 max.
niobium	2% max. but at least 11 times the C+N content,

the balance being iron and incidental impurities.

3,963,533

LOW TEMPERATURE MAGNETIC TREATMENT OF FERROMAGNETIC MATERIALS

James D. Collins, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1974, Ser. No. 535,978

Int. Cl.² C21D *1/04*

U.S. Cl. 148—108 **4 Claims**

1. A cryogenic-magnetic method of reducing dislocation density and altering dislocation distribution in an article formed from a polycrystalline ferromagnetic iron based material so as to provide improved mechanical properties, and resistance to corrosion, said method comprising:

a. reducing the temperature of said article to that of a relaxation point detectable by ultrasonic attenuation techniques;

b. imposing an alternating magnetic field on said article, said field having a maximum strength in the range of from about 50 to about 150 oersteds, and alternating at a frequency in the range of from about 2.0 to about 1,000 hertz until the ultrasonic attenuation at 5 Megahertz is reduced by from about 10% to about 50%;

c. removing said magnetic field; and

d. allowing said article to warm to room temperature.

3,963,534

ZIRCONIUM ALLOYS

Jean-Mathieu Frenkel, Paris; Jacques Pelchat, Vitry, and Michel Weisz, Orsay, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 28, 1974, Ser. No. 446,799

Claims priority, application France, Mar. 2, 1973, 73.7617

Int. Cl.² C21D *1/26*

U.S. Cl. 148—133 **4 Claims**

1. In a method of manufacturing fuel cans and pressure tubes from Zircaloy-2 or Zircaloy-4 for use in nuclear reactors the improvement wherein said fuel cans or pressure tubes are annealed at a temperature from 400°C to 750°C for a sufficient period of time to cause recrystallization, said period being at least ½ hour.

3,963,535

METHOD FOR CONTROLLING QUENCHING

Birger David Lineberg, Koping, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed July 20, 1973, Ser. No. 381,068

Claims priority, application Sweden, July 28, 1972, 9914/72

Int. Cl.² C21D *1/18*

U.S. Cl. 148—144 **4 Claims**

1. A method for the regulated quenching of hot steel objects in liquid, comprising submerging a hot steel object in a liquid which is at superatmospheric pressure, and after said hot steel object is submerged in the liquid reducing the pressure of the liquid in which the hot steel object is submerged, thereby to effect a rapid initial quench followed by a slower one down through the temperature range where martensite is formed.

3,963,536

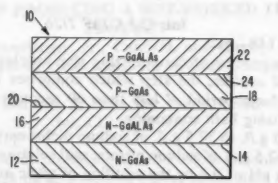
METHOD OF MAKING ELECTROLUMINESCENT SEMICONDUCTOR DEVICES

Michael Ettenberg, Freehold, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,758

Int. Cl.² H01L *7/38*

U.S. Cl. 148—171 **8 Claims**



1. A method of fabricating an electroluminescent semiconductor device having a recombination region comprising the step of:

depositing the semiconductor material of the device from the liquid phase wherein at least the portion deposited in the vicinity of the recombination region of the device is deposited from a solution saturated with the semiconduc-

tor material at a rate greater than 10 microns per minute by cooling said saturated solution at a rate greater than 18°C. per minute.

3,963,537
PROCESS FOR THE PRODUCTION OF A SEMICONDUCTOR LUMINESCENCE DIODE

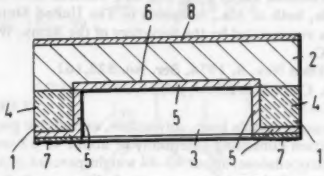
Hermann Kniepkamp, Munich, and Guenter Winstel, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 27, 1974, Ser. No. 500,844

Claims priority, application Germany, Oct. 2, 1973, 2349544

Int. Cl.² H01L *21/306, 29/06, 33/00*

U.S. Cl. 148—175 **7 Claims**



1. In the process of producing a semiconductor luminescence diode in which an epitaxial layer is deposited on a monocrystal composed of a semi-insulating semiconductor material and a pn-junction is formed in the epitaxial layer in such a manner that at least a part of the surface of the pn-junction runs parallel to the boundary area between said monocrystal and said epitaxial layer, the combination of said epitaxial layer and said monocrystal providing a light emitting diode, the improvement which comprises removing a portion of said monocrystal at least up to the level of the epitaxial layer to leave a border of monocrystal material, diffusing a dopant into the thus exposed epitaxial layer and the remaining border of monocrystal material to produce said pn-junction in said epitaxial layer, and finally applying a block-free electrode to each side of the resulting pn-junction.

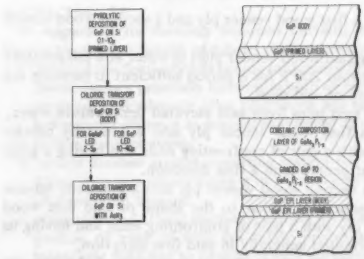
3,963,538
TWO STAGE HETEROEPITAXIAL DEPOSITION PROCESS FOR GaP/Si

Robert W. Broadie, Hopewell Junction; Bernard M. Kemlage, Kingston, and H. Bernard Pogge, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,604

Int. Cl.² H01L *21/205, 33/00*

U.S. Cl. 148—175 **16 Claims**


PYROLYTIC DEPOSITION OF GaP ON Si (1-10 Å PRIMED LAYER)
CHLORIDE TRANSPORT DEPOSITION OF GaP ON Si (BODY)
FOR GaAsP LED 2-7μ
FOR GaP LED 10-40μ
CHLORIDE TRANSPORT DEPOSITION OF GaP ON Si WITH AsH3
GaP BODY
GaP PRIMED LAYER
Si
CONSTANT COMPOSITION LAYER OF GaAsP1-x
GRADED GaP TO GaAsP1-x REGION
GaP EPI LAYER BODY
GaP EPI LAYER PRIMED
Si

1. A method of growing gallium phosphide on a silicon substrate comprising the steps of:

subjecting the silicon substrate to a high temperature bake cycle in the range of 1100°C for approximately 2 minutes;

pyrolytically depositing a first layer of GaP on Si to form a continuous thin epitaxial film; and

depositing a second layer of GaP onto the first layer by the halide transport process to form an epitaxial layer of GaP on the GaP primed Si suitable for use in the production of light emitting diodes.

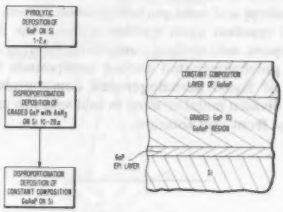
3,963,539
TWO STAGE HETEROEPITAXIAL DEPOSITION PROCESS FOR GaAsP/Si LED'S

Bernard M. Kemlage, Kingston, N.Y.; Jerry M. Woodall, Saratoga, Calif., and William C. Wuestenhoefer, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,590

Int. Cl.² H01L *21/205, 33/00*

U.S. Cl. 148—175 **6 Claims**


PYROLYTIC DEPOSITION OF GaP ON Si
DISPROPORTIONATION DEPOSITION OF GRADED GaP WITH AsH3 ON Si
DISPROPORTIONATION DEPOSITION OF CONSTANT COMPOSITION GaAsP ON Si
CONSTANT COMPOSITION LAYER OF GaAsP
GRADED GaP TO GaAsP REGION
GaP EPI LAYER
Si

1. A method of making a light emitting diode comprising the steps of:

pyrolytically depositing a first layer of gallium phosphide on silicon to form a thin epitaxial film;

depositing a graded second layer of GaP onto the first layer of GaP by the halide transport process with the bandgap of the GaP being altered by the addition of AsH_3 until a constant composition layer of GaAsP is achieved; and

growing a constant composition layer of GaAsP at an appropriate LED wavelength.

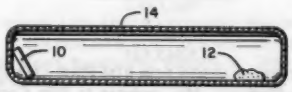
3,963,540
HEAT TREATMENT OF MERCURY CADMIUM TELLURIDE

Russell J. Camp, Jr., St. Louis Park; Maurice L. Hitchell, Bloomington; Joseph L. Schmit, Hopkins, and Ernest L. Stelzer, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 28, 1975, Ser. No. 554,293

Int. Cl.² C22F *1/02*

U.S. Cl. 148—20.3 **10 Claims**



1. A method of adjusting the stoichiometry of mercury cadmium telluride, the method comprising:

heating a body of mercury cadmium telluride and a quantity of excess constituent in a closed environment to a temperature near the solidus temperature of the body to provide a constituent vapor pressure within the closed environment; and

cooling the closed environment while maintaining a temperature profile within the closed environment to prevent any portion within the closed environment from being cooler than the body.

3,963,541

METHOD OF MANUFACTURING REACTION MIXTURES OF FINELY DIVIDED METALS OR ALLOYS AND SOLID PERHALOGENATED CARBON COMPOUNDS

Udo Klaus Paul Biermann, Eindhoven, and Johann Schroder, Aachen, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 13, 1973, Ser. No. 369,751

Claims priority, application Germany, June 21, 1972, 2230120

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.92 2 Claims

1. A method of manufacturing a mixture of finely divided metals or alloys and solid perhalogenated carbon compounds capable of reaction upon ignition without the formation of gases or vapors, said method comprising forming a solution of said solid polyhalogenated carbon compounds in a solvent consisting of liquid perhalogenated compounds, dispersing said finely divided metal or alloy in said solution and removing said solvent from said solution.

3,963,542

OXIDIZER COMPATIBLE SOLID PROPELLANT FLUORINE ATOM GAS GENERATOR

Donald Pilipovich, Agoura, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 18, 1973, Ser. No. 407,715

Int. Cl.² C06B *31/00, 27/00, 43/00, 45/10*

U.S. Cl. 149—19.3 8 Claims

4. A solid propellant fluorine atom gas generator system comprising:

a fluorocarbon as the binder and primary fuel source, and

NF_4BF_4 as a fluorine-containing oxidizer material having the oxidizing power contained substantially in the cation thereof.

7. A solid propellant fluorine atom gas generator system consisting of:

about 50–70 weight percent of a fluorine-containing oxidizer material having the oxidizing power contained substantially in the cation thereof,

about 30–50 weight percent of a fluorocarbon as a binder and primary fuel source, and

more than about 0 but less than about 15 weight percent of a powdered metal auxiliary fuel.

3,963,543

PRIMING FORMULATION FOR RIM FIRE AMMUNITION

Neil Prange, Florissant, Mo., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 4, 1975, Ser. No. 610,345

Int. Cl.² C06C *7/00*

U.S. Cl. 149—23 3 Claims

1. A glassless priming composition for percussion ignition ammunition, said composition comprising: at least one primary explosive constituent; at least one oxidizing constituent, and ground zirconium oxide particles for use as a frictionator and sensitizer.

3,963,544

PRIMING FORMULATION FOR RIM FIRE AMMUNITION

Edward Anthony Staba, Higganum, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 4, 1975, Ser. No. 610,512

Int. Cl.² C06C *7/00*

U.S. Cl. 149—23 3 Claims

1. A glassless priming composition for percussion ignition ammunition, said composition comprising: at least one primary explosive constituent; at least one oxidizing constituent; and a frictionator and sensitizer consisting of particles of ground cupric oxide.

3,963,545

ENERGETIC DOUBLE BASE PROPELLANT COMPOSITION

William E. Thomas, Lacey's Spring, and Thomas E. Martin, Blountsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,161

Int. Cl.² C06B *25/34, 25/24, 25/26, 25/02*

U.S. Cl. 149—92 2 Claims

1. An energetic double base, solventless, extrudable propellant composition consisting essentially of about 48-52 weight percent of nitrocellulose, about 40–44 weight percent of nitroglycerin, about 2–4 weight percent of di-n-propyladipate, about 2-2.5 weight percent of 2-nitrodiphenylamine, about 0.1–0.2 weight percent candelilla wax, and about 1.0–1.3 weight percent aluminum.

3,963,546

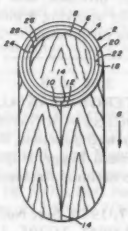
METHOD OF MAKING A MULTIPLE PLY WOOD ARTICLE

Barney Roberti, Mathews Run Road, Youngsville, Pa. 16371

Division of Ser. No. 488,327, July 15, 1974. This application Mar. 25, 1976, Ser. No. 561,750

Int. Cl.² B29C *27/00*

U.S. Cl. 156—69 10 Claims



1. A method of manufacturing a multiple ply wood article comprising

providing a first wood veneer ply and a second wood veneer ply,

immersing said wood veneer plies in water at a temperature above about 200°F for a period sufficient to increase the flexibility of said plies,

removing said plies from said elevated temperature water,

forming a first wood veneer ply into a generally tubular shape with a pair of confronting ends and having a grain oriented generally in a first direction,

forming a second wood veneer ply into a generally tubular shape generally similar to the shape of said first wood veneer ply with a pair of confronting ends and having its grain oriented generally in said first direction,

applying adhesive means to at least one of the exterior surface of said first wood veneer ply and the interior surface of said second wood veneer ply,

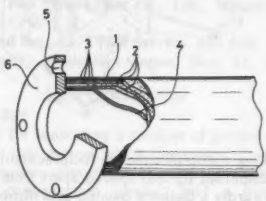
placing said second wood veneer ply in exteriorly disposed surface to surface adjacency with respect to said first wood veneer ply with the grain orientations of said first and second wood veneer plies being generally parallel, and

securing said wood veneer plies in such relative position to establish a tubular article.

3,963,547
METHOD OF MANUFACTURING COMPOSITE HEAT-INSULATING MATERIAL

Yasuhisa Kaneko, and Fumiyoshi Noda, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 2, 1974, Ser. No. 457,363
Claims priority, application Japan, Apr. 11, 1973, 48-41075
Int. Cl.[2] B32B *5/18*
U.S. Cl. 156—79 **6 Claims**



1. A method of manufacturing a composite heat insulating material comprising the steps of

forming on aluminum foil a coating of an unexpanded foamable ceramic material selected from the group consisting of water glass and water glass mixed with aluminum hydroxide, magnesium hydroxide, or alumina while causing said unexpanded material to adhere to said foil,

introducing a plurality of layers of said coated foil into an enclosed space between an inner member and an outer jacket encircling said inner member with said layers parallel to the wall of said jacket, and

then heating said layers to cause foaming of said ceramic material to form an expanded heat insulating body filling said space.

3,963,548
APPARATUS AND METHOD OF FORMING HEMMED CURTAINS AND THE LIKE

Alexander George, Charlotte; Howard Snelson, Hickory; James White, Mooresville, and Jacob D. Lentz, Jr., Troutman, all of N.C., assignors to Miracle Seam, Inc., Charlotte, N.C.

Filed May 28, 1974, Ser. No. 473,426
Int. Cl.[2] B31F *1/00*
U.S. Cl. 156—88 **24 Claims**

1. Apparatus for forming hemmed curtains and the like from a continuous length of fabric, said apparatus including:

a. means for selectively advancing said continuous length of fabric along a generally horizontal path of movement and stopping said advance after said fabric has moved a predetermined distance to present said fabric at an operating station for processing;

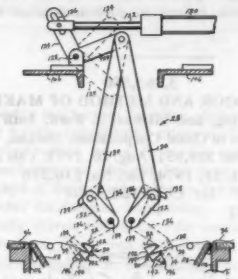
b. means located at said operating station for cutting said fabric into two pieces along a line transverse to said path of movement thereof;

c. means located at said operating station for folding the end portion of each of said cut fabric pieces along a first transverse fold line to overlap a first adjacent portion of said fabric piece and for folding said first adjacent portion along a second transverse fold line to overlap a next adjacent portion of said fabric piece with said end portion disposed between said first and next adjacent portions so as not to expose the cut edge of said end portion, said folding means being arranged to first tuck said fabric along said second transverse fold line after said fabric has been cut and to tuck said fabric along said first transverse fold line at a location between said first tuck and the cut end of said fabric piece, and

d. means located at said operating station for securing said fabric piece to its next adjacent fabric portion along a transverse line located near the cut edge of said end portion and located between said first and second transverse fold lines to thereby form a permanent double-fold in each said fabric piece.

22. A method of forming hemmed curtains and the like from a continuous length of fabric, said method including the steps of

a. selectively advancing said continuous length of fabric along a generally horizontal path of movement and stopping said advance after said fabric has moved a predetermined distance;



b. carrying at least two adhesive filaments transversely across said fabric in spaced parallel relation to one another;

c. cutting said stopped fabric into two pieces along a line transverse to said path of movement thereof, and intermediate said spaced adhesive filaments;

d. folding the end portion of each said stopped fabric pieces along a first transverse fold line to overlap a first adjacent portion of said fabric piece and then folding said first adjacent portion along a second transverse fold line to overlap a next adjacent portion of said fabric piece with said end portion disposed between said first and next adjacent portions so as not to expose the cut edge of said end portion and with one of said adhesive filaments disposed between said end portion and said next adjacent portion of each said fabric piece; and

e. heating said adhesive filaments while said fabric is stopped to melt said adhesive filament and secure said end portions of each fabric piece to said next adjacent portion thereof.

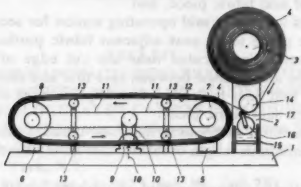
3,963,549
METHOD AND APPARATUS FOR PRODUCING CONTINUOUS SURFACE ELEMENTS

Max Otto Henri Rasmussen, Rubjerg 8, 2690 Karlslunde, Denmark

Filed June 13, 1974, Ser. No. 478,958
Int. Cl.[2] B65H *81/00*; B29C *17/00*; B32B *7/14*
U.S. Cl. 156—193 **5 Claims**

1. Method for producing continuous surface elements, for instance for the so-called air supported shelters, and consisting of tubular formed units of flexible material lying side by side characterized in winding tubular foil, preferably of plastic material, in several layers between two drums, the distance between which is mainly equal to multiples of said breadth, applying adhesive to the tubular foil immediately before wind-

ing on the drums, such that the outward side of the tubular foil on a preceding winding adheres along a path to the inward side of the tubular foil in the following winding, and cutting the windings, after winding a suitable number of loops depending on the desired length of the surface element, mainly



perpendicular to the longitudinal direction of the tubular foil, pulling the two outer tubular foils in the stack thus obtained from each other along their whole length, and furthermore introducing suitable braces in each individual tubular foil section.

3,963,550

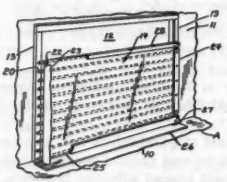
GRAIN DOOR AND METHOD OF MAKING

William E. Bruning, and Michael J. Ford, both of Omaha, Nebr., assignors to Omni Corporation, Omaha, Nebr.

Division of Ser. No. 389,951, Aug. 20, 1973. This application Oct. 21, 1974, Ser. No. 516,216

Int. Cl.² B32B *31/04*

U.S. Cl. 156—252 **1 Claim**



1. In a method of producing grain doors, the steps of advancing a generally rectangular double face corrugated panel along a predetermined path,

applying a plurality of spaced apart stripes of adhesive to one face of said panel with said stripes extending parallel to said path while terminating each stripe a spaced distance inwardly of the adjacent end of said door panel to permit ready development of a side flap,

unwinding a plurality of rolls of metal ribbon, one for each stripe and punching openings in each ribbon in a plurality of longitudinally aligned, equally spaced apart positions only adjacent each strap end to provide areas for nailing each strap end to a car door post, said openings being relatively elongated in the direction of said path,

transversely, arcuately severing each ribbon to provide a strap for each stripe having a length slightly less than the panel dimension parallel to said path, and

pressing a strap into engagement with each stripe.

3,963,551

METHOD FOR BONDING SEMICONDUCTOR CHIPS

Edward J. Marlinski, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Division of Ser. No. 448,330, March 5, 1974, Pat. No. 3,933,187. This application Jan. 17, 1975, Ser. No. 541,831

Int. Cl.² H05K *3/00*

U.S. Cl. 156—295 **3 Claims**

1. In a method for bonding a semiconductor chip to a contact pad in a hybrid circuit using a tubular dispenser having a dispenser tip, comprising the steps of:

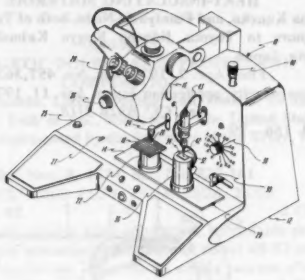
a. pressurizing a conductive epoxy within the dispenser until a small drop forms adjacent the end of the dispenser tip;

b. touching said epoxy drop to said contact pad;

c. releasing the pressure within the dispenser;

d. reciprocating said dispenser tip away from said contact pad, thereby leaving a deposit of epoxy on said pad; and

e. placing a chip on said deposit of epoxy, the improvement comprising the steps of:



f. providing a stop mechanism reciprocatable together with said dispenser tip and spaced apart from and extending downwardly a distance beyond said dispenser tip, and

g. bringing the dispenser tip from a first, upper, position to a second, lower, position at a predetermined distance, which is independent of work and work holder variations and is determined by the distance by which said stop mechanism extends beyond said dispenser tip, from the upper surface of said pad, thereby touching only a predetermined area of said epoxy drop to said contact pad.

3,963,552

METHOD OF FEEDING SHEETS TO A CONTINUOUS LAMINATING PRESS

Arthur L. Troutner; John R. Russell; Alan W. Johnson, and Clifford R. Johnson, all of Boise, Idaho, assignors to Trus Joist Corporation, Boise, Idaho

Division of Ser. No. 258,898, June 1, 1972, Pat. No. 3,841,145. This application May 8, 1974, Ser. No. 467,944

Int. Cl.² B65H *29/66*

U.S. Cl. 156—299 **3 Claims**

1. The method of assembling of sheets of material into a linearly extending stack, comprising the steps of:

a. arranging a first stack of sheets above a rectilinear conveyer with the sheets progressively overlapped by predetermined increments in the direction of conveyer travel with the bottom sheet of the stack forwardmost and with the forward portion of said bottom sheet engaging the rectilinear conveyer,

b. advancing the rectilinear conveyer by a predetermined increment to deposit said bottommost sheet of the first stack upon the rectilinear conveyer,

c. placing a first sheet, which is to form one sheet of a second stack, on the rectilinear conveyer with its leading end overlapping the trailing end of the sheet from the first stack already deposited thereon,

d. advancing the rectilinear conveyer by a predetermined increment to deposit the new bottommost sheet of the first stack on said first sheet of the second stack,

e. placing a second sheet, which is to form part of the second stack, on said new bottommost deposited sheet of the first stack,

f. repeating steps *b*, *c*, *d*, and *e* until all of the sheets of the first stack have been deposited on the rectilinear conveyer and a second stack has been built up thereon with its component sheets progressively overlapped at predetermined intervals with the sheets of the first stack,

g. elevating the trailing end of the second stack above the conveyer, and

h. building up on the rectilinear conveyer in like manner as specified in steps *b* to *g* successive overlapped stacks in a number calculated to produce a continuous sheet assembly of the desired length.

3,963,553
PROCESS FOR SEPARATING A NUMBER OF SHEETS INTO GROUPS

Masataka Kiritani, and Hajime Kato, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

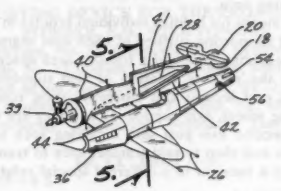
Filed Dec. 11, 1974, Ser. No. 531,500
Claims priority, application Japan, Dec. 11, 1973, 48-139417
Int. Cl.² B41L *1/24*
U.S. Cl. 156—305 **9 Claims**

1. A process for separating a number of pressure sensitive copying papers into groups which comprises (1) coating an adhesive composition comprising a naphthalene sulfonic acid-formaldehyde condensation product and a water-soluble metal salt on an edge of a stack assembly of said copying papers and then (2) fanning said copying papers; said naphthalene sulfonic acid-formaldehyde condensation product comprising about 5 to 40% by weight of the adhesive composition and said watersoluble metal salt, which consists of an ammonium salt or a salt of a metal selected from the group consisting of a univalent metal, a divalent metal and a trivalent metal, comprising about 0.1 to 6% by weight of the adhesive composition.

3,963,554
METHOD OF ASSEMBLING MODEL AIRPLANE

Glen Sigafoose, 401 S. Front, Montezuma, Iowa 50171

Division of Ser. No. 95,059, Dec. 4, 1970, Pat. No. 3,699,706. This application Dec. 23, 1971, Ser. No. 211,591
Int. Cl.² A63H *27/00*
U.S. Cl. 156—304 **1 Claim**



1. The method of assembling a model airplane fuselage comprising the steps of,

providing a single balsa wood flat profile fuselage,

positioning a series of pins in the plane of said profile fuselage on the top and bottom longitudinal edges of said profile fuselage substantially along its longitudinal centerline,

positioning one of a pair of plastic convex outwardly half sections of substantially sheet material to the side of said profile fuselage with the longitudinal edges thereof engaging said pins and glue being applied to bond said half section to said profile fuselage longitudinal edges,

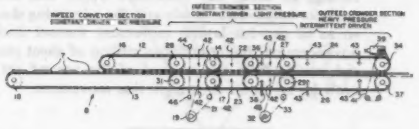
removing said pins, and

positioning said other fuselage half section to said profile fuselage with the longitudinal edges of said half sections substantially engaging each other and covering the top and bottom longitudinal edges of said profile fuselage and glue being applied to bond said other half section to said profile fuselage longitudinal edges.

3,963,555
METHOD AND APPARATUS FOR EDGE GLUING

Arnold A. Zweig, Olympia, Wash., assignor to Simpson Timber Company, Seattle, Wash.

Filed Dec. 28, 1973, Ser. No. 429,267
Int. Cl.² B32B *31/00*
U.S. Cl. 156—358 **8 Claims**



1. A crowder mechanism for edge gluing individual sheets of material having non-parallel edges to form a continuous ribbon thereof which issues from the outfeed end of the crowder mechanism in straight line flow regardless of the irregular shape of the individual sheets fed into the infeed end of the crowder mechanism, comprising:

a constantly driven infeed crowder section for conveying the individual sheets into edge abutting relationship with the trailing edge of the continuous ribbon being formed having first pressure means exerting a first pressure on the sheets sufficient to contact and convey the sheets but allowing lateral shift thereof as necessary in order for the leading edge of the sheet being conveyed to abut with the trailing edge of the ribbon being formed;

an outfeed crowder section receiving the abutting individual sheets conveyed by the infeed crowder section having second pressure means acting against the upper and lower faces of the sheets sufficient to prevent any substantial lateral movement of the continuous ribbon being formed and conveyed;

intermittent variable torque, load responsive drive means driving the outfeed crowder section at a speed to create light abutting edge pressure between the abutting sheets as they move through the infeed crowder section to the outfeed crowder section;

sensing and signal means for sensing pressure of an individual sheet into the infeed crowder section; and

means operating the intermittent drive means of the outfeed crowder section responsive to the sensing and signal means to interrupt operation of the outfeed crowder section in the absence of sheets entering the infeed crowder section.

5. In a crowder mechanism for advancement of individual sheets of material into edge abutment with preceding advancing sheets to form a continuous ribbon thereof, said crowder mechanism including:

first and second sets of crowder members, each set including spaced apart upper and lower endless crowder members disposed above and below said advancing sheets with means to pressure said crowder members into contact with the surfaces of the sheets,

a drive and pressurizing system comprising:

first drive means connected to constantly drive said first set of upper and lower crowder members,

intermittent variable torque, load responsive drive means connected to drive the second set of upper and lower crowder members at a speed to create light abutting edge pressure between the abutting

sheets as they move through the first set of crowder members to the second set of crowder members,

sensing and control means responsive to the passage of sheets into said first set of crowder members for controlling the operation of said intermittent drive means so that said second set of crowder members is driven only upon passage of sheets into said first set of crowder members,

first pressure means for exerting a first pressure on said first set of crowder members allowing lateral shift of the individual sheets of material as necessary for the leading edges of the sheets being conveyed to abut with the trailing edge of the continuous ribbon being formed, and

second pressure means for exerting a second pressure in excess of said first pressure on the second set of crowder members, said second pressure being great enough to cause the associated upper and lower crowder members to firmly grip the advancing sheets so as to prevent lateral movement thereof during advancement, the continuous ribbon of sheet material issuing from the outfeed of the second set of crowder members in straight line movement.

3,963,556

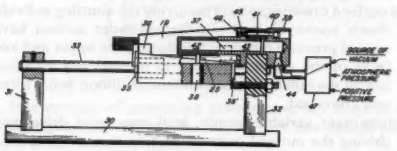
MORTAR CAVITY LINING

Harold A. Patterson, Middle Village, N.Y., and Victor Danylik, Dover, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 376,260, July 3, 1973, which is a division of Ser. No. 220,149, Jan. 24, 1972. This application July 26, 1974, Ser. No. 492,083

Int. Cl.² B69D 3/00

U.S. Cl. 156—423 1 Claim



1. An apparatus for adhesively bonding a metallic foil with the cartridge chamber of a separable mortar shell having flash holes which comprises:

a support for fixedly holding a mandrel means,

a cradle for holding said mortar shell,

a pin disposed in and extending out of said cradle for engagement in one of said flash holes,

fixedly held guide means for supporting said shell cradle for movement toward and from said mandrel means in alignment for insertion of said mandrel means into said chamber, said mandrel means including:

a hollow perforated mandrel having its interior communicating with an inlet port, and sealing means for providing a gaseous seal between said shell and said mandrel when said shell is disposed on said cradle and said mandrel is disposed within said chamber,

whereby said mandrel may be evacuated to retain thereabout an adhesively coated metallic foil, inserted into said chamber, and thereafter have positive pressure applied to blow out said foil against the wall of said chamber.

3,963,557

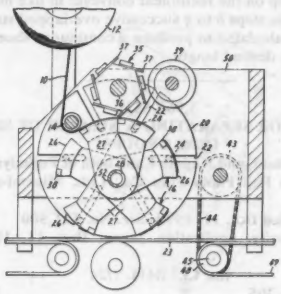
ARTICLE TRANSFERRING APPARATUS

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 473,327, May 28, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 571,907

Int. Cl.² B32B 31/00; B65C 9/00

U.S. Cl. 156—519 9 Claims



1. An apparatus suitable for receiving articles fed thereto continuously at a first feed rate and transferring said articles to a receiver at a different rate in different spacial relationship, said apparatus comprising:

a frame;

a driving wheel rotatably mounted on said frame on a first axis and having a plurality of generally radially extending cam surfaces;

means for rotating said driving wheel;

a plurality of supporting segments, each having an article supporting surface, rotatably mounted on arms extending radially outward from a second axis in parallel, spaced, fixed relationship to said first axis and supported by said frame;

cam followers attached to said segments and engaged with said cam surfaces on said driving wheel for imparting the rotational force of said driving wheel to said segments to rotate said segments about said second fixed axis;

drive means for feeding a continuous supply of articles to the supporting surface of said segments at an article receiving area;

holding means for holding individual articles in contact with a said supporting surface of each said segment between said receiving area and a transfer area spaced therefrom about the path of rotation of said supporting surfaces about said second axis whereby, upon rotation of said driving wheel, said supporting surfaces are driven about said second axis past said receiving area to receive an article and then to said transfer area to transfer the articles to a receiver in a different spacial relationship.

3,963,558

APPARATUS AND METHOD FOR PRODUCING SOLID POLYMERIC MATERIAL FROM A DILUTE POLYMER SOLUTION

Richard H. Skidmore, Strafford, Pa., assignor to W Bar E, Incorporated, Marianna, Fla.

Filed Dec. 9, 1974, Ser. No. 530,511

Int. Cl.² B01D 1/28; B01F 7/02; A01J 17/00

U.S. Cl. 159—2 E 13 Claims

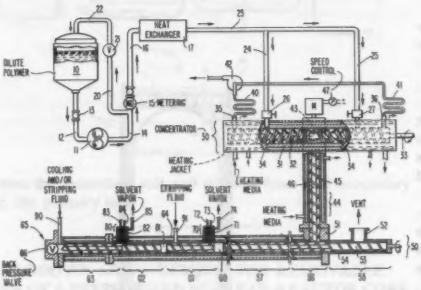
1. In an apparatus for producing solid polymer from a polymer solution which contains about 5 – 50% by weight of solid polymer in about 50 – 95% by weight of a solvent, the combination which comprises:

a. means for heating said polymer solution, and means for feeding it under pressure.

b. a concentrator connected to accept said heated and pressurized solution as a feed solution, including a low pressure chamber portion into which the feed polymer solution is introduced, and a vent means for release of solvent vapor vaporized in said chamber,

c. an extruder connected to receive the concentrated polymer solution from said concentrator, said concentrated polymer solution having a polymer content of about 30 – 80% by weight and about 70 – 20% by weight of solvent,

d. vent means on said extruder upstream of said solution receiving connection for venting further solvent vapor from the concentrated polymer feed,



e. counter-current fluid introducing means positioned downstream of the feed to said extruder and having connecting means for the introduction and flow of fluid counter-current to the movement of said concentrated polymer in said extruder,

f. means on said extruder for removal of said fluid and of materials stripped from said concentrated polymer by said fluid, at a location upstream of the point of introduction of said counter-current fluid but downstream of the point of introduction of said concentrated polymer, and

g. means at the extruder exit for controlling the back pressure of the polymer extruded from said extruder.

3,963,559
SPRAY DRYING DEVICE FOR THE PRODUCTION OF POWDER, E.G. MILK POWDER

Mogens Petersen, No. 31 Tjornevej, 2800 Lyngby, and Klaus Erik Gude, No. 22 Viekaer, 2950 Vedbaek, both of Denmark

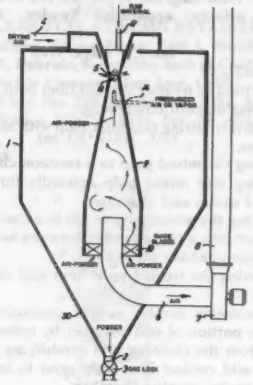
Continuation of Ser. No. 218,367, Jan. 17, 1972, abandoned. This application July 24, 1974, Ser. No. 491,192

Claims priority, application Denmark, Jan. 19, 1971, 209/71

Int. Cl.² B01D *1/16*

U.S. Cl. 159—4 S **7 Claims**

1. A spray drying apparatus for the production of powder, comprising a drying chamber; a vertically axised rotatable atomizer wheel mounted in the upper portion of said chamber; means for supplying a solution or dispersion of solids to said atomizer wheel; means for supplying drying air to said drying chamber adjacent said wheel; an outlet for withdrawing powder from said drying chamber in the lowest thereof; a cyclone mounted vertically in said drying chamber and coaxially with said wheel for separating powder from spent drying air, said cyclone having (i) a bottom, peripheral tangential air-powder inlet communicating directly with the lower portion of said drying chamber, (ii) an air-powder outlet located subjacent to and coaxially with said atomizer wheel so as to provide a passage for air and powder discharge from said cyclone towards said atomizer wheel, (iii) and an air outlet for withdrawing spent drying air from within said cyclone; means for producing inflow of air and powder to said cyclone through



said air-powder inlet; said air outlet providing for outflow of air from said cyclone and drying chamber.

3,963,560
COMPOSITION FOR DEINKING WASTE PAPER

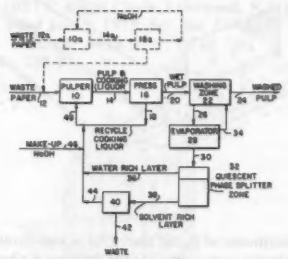
Thomas S. Mestetsky, Belvidere, N.J., and Bruce G. Webster, Cincinnati, Ohio, assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 302,657, Nov. 1, 1972, Pat. No. 3,846,227. This application Oct. 31, 1974, Ser. No. 519,748

The portion of the term of this patent subsequent to Nov. 5, 1991, has been disclaimed.

Int. Cl.² D21C *5/02*

U.S. Cl. 162—5 **9 Claims**



1. A waste paper pulp deinking composition containing between about 1 and about 20 weight percent waste paper based on the weight of the waste paper deinking composition employed and a waste paper deinking composition comprising from about 0.5 to about 200 parts by weight of water, from about 0.05 to about 1 part by weight of a water-soluble nonvolatile, inorganic ionic compound containing a cation taken from the group consisting of sodium, potassium, calcium, iron, aluminum and magnesium, and from about 0.75 to about 25 weight percent of an N-alkyllactam solvent.

3,963,561

RECIRCULATION OF UNCONSUMED OXYGEN PULP BLEACHING GAS

Johan Christoffer Fredrik Carl Richter, St.-Jean-Cap-Ferrat, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Aug. 26, 1974, Ser. No. 500,899

Claims priority, application Sweden, Aug. 27, 1973, 1150/73

Int. Cl.² D21C 9/10

U.S. Cl. 162—17 4 Claims

1. A method of treating cooked fiber pulp as it comes from a continuous digestor comprising:

a. intensively mixing said fiber pulp with an oxygen containing gas;

b. feeding the mixed pulp to a reaction chamber;

c. passing said mixed pulp upwardly through an upflow funnel within said chamber;

d. allowing the mixed pulp to fall in a cascading down flow manner into a ring chamber between said funnel and the reaction chamber shell; and

e. removing the treated pulp from said reaction chamber, while

f. recirculating surplus oxygen containing gas from the upper portion of said chamber by removing said surplus gas from the chamber and emulsifying the removed gas with said cooked fiber pulp prior to feeding the mixed pulp to the reaction chamber:

whereby unconsumed gas in steps (a) through (d) is returned to the upper portion of said reactor together with said cooked fiber and in said ring chamber no gas is admitted other than that which has been mixed in the pulp.

3,963,562

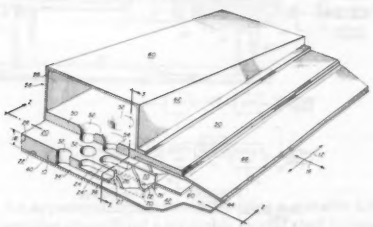
SLURRY DISTRIBUTOR

Harold E. Dunlap, Auburn, Mass., assignor to Lodding Engineering Corporation, Auburn, Mass.

Filed Jan. 14, 1974, Ser. No. 432,901

Int. Cl.² D21F 1/06

U.S. Cl. 162—343 7 Claims



1. A distributor of liquid slurry for a web-forming machine, said distributor comprising means defining a plurality of separated slurry passages, each passage having a slurry-receiving end and a slurry-delivery end, and being continuous between said ends, said passages being distributed in the cross-machine direction, all of said passages having slurry-receiving ends oriented in a first direction for receiving slurry from a common source, each passage making a substantially rectangular direction change between its slurry-receiving end and its slurry-delivery end so as to orient said passage in a second direction prior to its slurry-delivery end, a slurry flow system including turbulence-inducing means and means coupling all of the slurry-delivery ends of the passages to said turbulence-inducing means, and slice means for receiving slurry from said turbulence-inducing means.

3,963,563

BURST SHIELD FOR A PRESSURIZED NUCLEAR-REACTOR CORE AND METHOD OF OPERATING SAME

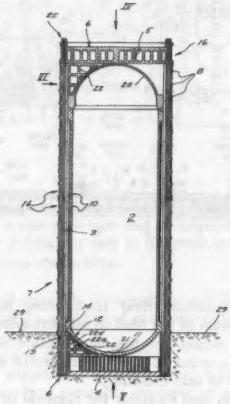
Burkhard Beine, Tonisvorst, and Franz Schilling, Kempen, both of Germany, assignors to Siempelkamp Giesserei KG, Krefeld, Germany

Filed Feb. 11, 1974, Ser. No. 441,492

Claims priority, application Germany, Feb. 13, 1973, 2306959

Int. Cl.² G21C 17/00

U.S. Cl. 176—19 R 11 Claims



1. A burst shield for a pressurized nuclear-reactor core, said shield comprising:

a base underneath said core;

a closed side wall extending upwardly from said base and spacedly surrounding said core, said wall being formed of a plurality of cast-iron elements and a plurality of elongated prestressing members under tension securing said elements together;

a top removably engaged with said wall over said core;

means for releasably securing said top to said wall over said core; and

a plurality of cast-iron filler bodies in the space between and engaging said wall and said core.

3,963,564

METHOD FOR PREVENTING TRITIUM CONTAMINATION OF SECONDARY SALT AND STEAM IN A MOLTEN SALT REACTOR

Alfred Lecocq, Bures-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 21, 1974, Ser. No. 516,421

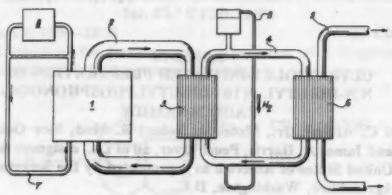
Claims priority, application France, Oct. 24, 1973, 73.37874

Int. Cl.² G21C 15/00

U.S. Cl. 176—37 2 Claims

1. A method for preventing tritium contamination of the secondary salt and of the steam within a molten salt reactor,

wherein said method consists in establishing within the secondary salt circuit a hydrogen pressure such that the hydrogen



saturates the secondary salt and diffuses from said secondary salt to the primary salt.

3,963,565

HOLDDOWN ARRANGEMENT FOR REMOVABLE COVER OF A PRESSURIZED NUCLEAR-REACTOR CORE AND METHOD OF USING SAME

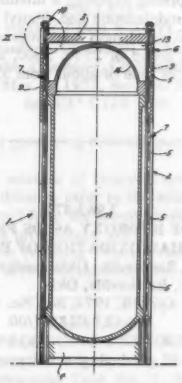
Burkhard Beine, Tonisvorst, Germany, assignor to Siempelkamp Giesserei KG, Krefeld, Germany

Filed Feb. 11, 1974, Ser. No. 441,491

Claims priority, application Germany, Feb. 13, 1973, 2306947

Int. Cl.² G21C *9/00*

U.S. Cl. 176—38 **8 Claims**



1. A prestressed shield for a nuclear reactor, said shield comprising:

an upright side wall having an upper edge and formed with a plurality of passages opening at said edge;

a cover engaged over said edge and having a plurality of throughgoing holes registrable with said passages;

a spacer element in each of said holes and extending up from said edge;

a stressing member in each of said passages and each having a lower end anchored below said edge and an upper end projecting up through a respective hole past a respective spacer element; and

means on said upper ends of said stressing members engaged selectively with said cover and with said spacer element for prestressing said members selectively against said cover and against said edge.

3,963,566

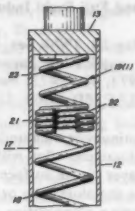
NUCLEAR FUEL COLUMN RETAINER

Donald F. MacMillan, Tokyo, Japan; Bart A. Smith, San Jose, and Richard P. Dubrule, Escondido, both of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 295,460, Oct. 6, 1972, abandoned. This application July 24, 1974, Ser. No. 491,276

Int. Cl.² G21C *3/16*

U.S. Cl. 176—68 **12 Claims**



1. In a nuclear reactor fuel element comprising a tube, end plugs sealing the ends of said tube and a column of nuclear fuel disposed in a part of said tube thereby forming a plenum free of said nuclear fuel adjacent one of said end plugs, said one of said end plugs having a surface within said tube, the improvement comprising: a retaining spring extending through said plenum with one end adjacent said column of fuel and its other end short of said surface of said one of said end plugs; and a barrier member formed of a helical coil having a plurality of turns mated inside a plurality of turns of said other end of said retaining spring and extending to said surface of said one of said end plugs, said barrier member being formed of a material different from the material of said retaining spring.

3,963,567

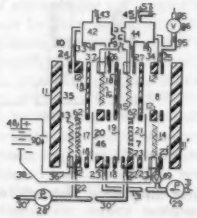
ELECTROLYTICDIALYSIS

Marc Cole, 1057 C Argyll Circle, Lakewood, N.J. 08701

Filed Jan. 9, 1975, Ser. No. 539,632

Int. Cl.² B01K *5/00*; C02B *1/82*

U.S. Cl. 204—180 P **11 Claims**



1. The method for electrolytically dialyzing the solute of a solution of an electrolyte, said solution being contained in each cell of a group of functionally joined cells, each of said cells being provided with an ion-selective membrane, and each of said cells being compartmented by an ion-impervious dielectric membrane, which comprises subjecting the said solution to the action of a common direct electric field in such manner as to cause migration of ions of like charge of said solution thru said ion-selective membrane into a compartment

of a neighboring cell whereas ions of opposite charge are sequestered by said ion-impervious membrane, allowing mutual electric discharge between the migrated and the sequestered groups of ions by electrically conductive means, recovering the resulting atoms, molecules, and reaction products of said atoms and molecules with the solvent of said solution, and also recovering a portion of the said solvent having a changed concentration of ions.

3,963,568
PROCESS FOR COATING ALUMINUM OR ALUMINUM ALLOY

Norio Nikaido; Shinji Shirai; Mototaka Iihashi, and Sueo Umemoto, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd. and Fuji Sashi Industries, Limited, both of, Japan

Filed May 28, 1974, Ser. No. 474,052

Claims priority, application Japan, May 30, 1973, 48-61068; Aug. 24, 1973, 48-95473; Nov. 20, 1973, 48-131095

Int. Cl.² C25D *13/06, 13/10, 13/20*

U.S. Cl. 204—181 **11 Claims**

1. In coating aluminum or an aluminum alloy by contacting the aluminum or aluminum alloy with hot water or steam to form a boehmite layer on its surface and thereafter electrophoretically coating the aluminum or aluminum alloy with an electrophoretic coating composition to form a resin layer, a process which is characterized in that said electrophoretic coating composition contains at least one water-soluble salt of an oxyacid selected from the group consisting of silicic acid, boric acid, phosphoric acid, vanadic acid, tungstic acid, permanganic acid, molybdic acid and stannic acid, wherein said water-soluble salt is contained in an amount of 0.001 to 10 parts by weight, based on 100 parts by weight of the binder resin contained in the electrophoretic coating composition.

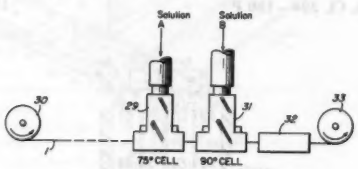
3,963,569
APPARATUS FOR PLATING ELONGATED BODIES

Emil Toledo, Natick, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 422,442, Dec. 6, 1973, Pat. No. 3,894,924, which is a division of Ser. No. 304,692, Nov. 8, 1972, Pat. No. 3,847,759, which is a division of Ser. No. 93,333, Nov. 27, 1970, Pat. No. 3,736,576. This application Dec. 5, 1974, Ser. No. 529,778

Int. Cl.² C25D *5/08, 17/00*

U.S. Cl. 204—206 **2 Claims**



1. Plating apparatus for plating magnetic memory storage wire comprising:

a plurality of plating cells;

each of said cells having a nonconducting body with a bore therein for the passage of said wire therethrough during plating;

each of said bores having a plurality of passages communicating therewith and spaced along said bore, the axes of said passages communicating with a first of said bores forming an angle with the axis of said first bore which is different from the angle of said passages communicating with a second of said bores;

means for producing a flow of plating electrolyte through said passages; and

means for passing a plating current through said electrolyte to a wire in said bores.

3,963,570
ULTRAVIOLET-INITIATED PREPARATION OF N,N-DIBUTYL-9(10)-DIBUTYLPHOSPHONOOCTADECANAMIDE

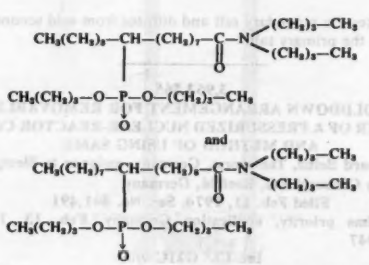
Jett C. Arthur, Jr., Metairie; Robert R. Mod, New Orleans, and James A. Harris, Pearl River, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 26, 1974, Ser. No. 509,584

Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **5 Claims**

1. A process for preparing N,N-dibutyl-9(10)-dibutylphosphonooctanamide, which is represented by the general formula:



the process comprising exposing a mixture consisting essentially of N,N-dibutyloleamide and dibutyl phosphite in about 1:3 molar ratio to wavelength intensities selected from maximum wavelength group of 2537, 3000, and 3500 angstrom units, for periods of time of about from 5.5 to 17 hours.

3,963,571
OXIDATION OF HYDROXY ACIDS PRODUCED FROM BACTERIAL OXIDATION OF PARAFFINS

Howard W. Bost, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 10, 1974, Ser. No. 459,623

Int. Cl.² C12B *1/00*

U.S. Cl. 195—28 R **9 Claims**

1. A method of producing a macrocyclic ketone which comprises:

a. microbially oxidizing a n-paraffin containing from about 6 to about 22 carbon atoms to produce a fermentation liquor containing a mixture of a diacid and a hydroxy acid;

b. separating said mixture of said diacid and said hydroxy acid from said fermentation liquor;

c. subjecting said mixture to oxidizing conditions so as to oxidize said hyroxy acid to produce additional diacid;

d. esterifying said diacid to produce a diester;

e. condensing intramolecularly said diester to produce a cyclic hydroxy ketone; and,

f. reducing said cyclic hydroxy ketone to produce a macrocyclic ketone.

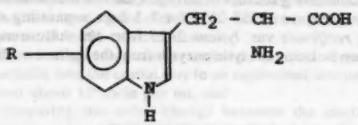
3,963,572

FERMENTATIVE PROCESS FOR THE PRODUCTION OF L-TRYPTOPHAN AND ITS DERIVATIVES

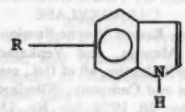
Sten Vilhelm Gatenbeck, Taby, and Per Olof Hedman, Johanneshov, both of Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Feb. 28, 1975, Ser. No. 554,344
Claims priority, application Sweden, Mar. 5, 1974, 7402889
Int. Cl.² C12D 13/06
U.S. Cl. 195—28 N 21 Claims

1. Method for fermentative preparation of l-Tryptophan and derivative of the general formula



where R is hydrogen, hydroxyl, alkyl or alkoxy groups from indole or indole derivative of the general formula



where R has the same meaning as above, characterized in that the fermentation is carried out in a substrate consisting essentially of methanol as the main source for carbon and is carried out using methanol using bacteria of a type that assimilates methanol in such a way that the methanol after oxidation reacts with intracellular glycine, whereby serine is formed.

3,963,573

PROCESS FOR PRODUCING N-ACYL-L-METHIONINE

Clyde Eugene Stauffer, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 3, 1975, Ser. No. 554,947
Int. Cl.² C12B 1/00
U.S. Cl. 195—29 9 Claims

1. A process for producing optically pure N-acyl-L-methionine comprising:

1. subjecting a mixture of N-acyl-L-methionine ester and N-acyl-D-methionine ester to the action of a proteolytic enzyme selected from the group consisting of microbially derived serine proteinases; and
2. separating the resulting N-acyl-L-methionine from the unreacted N-acyl-D-methionine ester.

3,963,574

PROCESS FOR PRODUCING 2-KETO-L-GULONIC ACID

Takayasu Sonoyama, No. 13-13, 2-cho, Takeshirodai, Sakai, Osaka Pref.; Hiroyoshi Tani, No. 3, 3-chome, Saigodori, Moriguchi, Osaka Pref.; Bunji Kageyama, No. 2-3, Shimokaiinjiyokoyama, Nagaokakyo, Kyoto Pref.; Kobee Kobayashi, No. 5-11, Omori-cho, Nishinomiya, Hyogo Pref.; Tahiko Honjo, No. 973, Niine, Minoo, Osaka Pref., and Shigeo Yagi, No. 10-3, 3-chome, Matsugaoka, Takatsuki, Osaka Pref., all of Japan

Filed Mar. 21, 1975, Ser. No. 560,886
Claims priority, application Japan, Sept. 20, 1974, 49-109315
Int. Cl.² C12D 1/02
U.S. Cl. 195—30 7 Claims

1. A process for producing 2-keto-L-gulonic acid or a salt thereof which comprises; contacting the 2-keto-L-gulonic acid producing microorganism strain, *Brevibacterium nov. sp.* ASM-856-4, ATCC 31083, or treated cells of said microorganism strain having the enzyme activity to convert 2,5-diketo-D-gluconic acid to 2-keto-L-gulonic acid, with 2,5-diketo-D-gluconic acid or a salt thereof, under conditions sufficient to produce 2-keto-L-gulonic acid, and recovering the produced 2-keto-L-gulonic acid or any salts thereof from the resulting mixture.

3,963,575

PRODUCING PULLULANASE WITH ORGANISMS HAVING A SUPERIOR CAPACITY TO ELABORATE PULLULANASE

Anthony A. Bulich, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Feb. 25, 1974, Ser. No. 445,190
Int. Cl.² C12D 13/02, 13/10; C07G 7/02
U.S. Cl. 195—31 R 32 Claims

1. In a method for producing pullulanase by inoculating an aqueous nutrient medium containing assimilable carbon and assimilable nitrogen sources with an aerobic, pullulanase producing microbial organism to provide a culture thereof, incubating the culture under aerobic conditions conducive to the production of pullulanase and thereby providing production culture media thereof, and thereafter recovering a pullulanase preparation from the production culture media, the improvement which comprises:

A. inoculating a nutrient medium with a pullulanase producing organism derived from the Klebsiella genus, wherein said organism is characterized as:
   a. elaborating at least three times more pullulanase when amylopectin of a D.E. of less than 2.0 is employed as the sole carbohydrate source comparative to pullulanase elaboration in a nutrient medium wherein the major carbohydrate (on an equivalent carbohydrate weight basis) is a carbohydrate source member selected from the group consisting of maltose, dextrose, lactose and pullulan;
   b. elaborating pullulanase at a ratio of extracellular pullulanase to superficially bound cell pullulanase between about 2:3 to less than 7:3 when said organism is elaborated in a nutrient medium containing amylopectin as the sole carbohydrate source;
   c. elaborating pullulanase in a nutrient medium which contains dextrose as a sole carbohydrate source; and

B. incubating the pullulanase producing organism in a nutrient medium for a period of time sufficient to provide a production culture media which contains at least 350 units of pullulanase for each milliliter of production culture media with the production culture media containing a ratio of extracellular pullulanase to superficially bound pullulanase between about 2:3 to less than about 7:3.

26. A pullulanase preparation suitable for use in hydrolyzing alpha-1, 6-glucosidic starch linkages and prepared from a culture media containing at least 500 units of pullulanase for each milliliter of culture media with a ratio of extracellular pullulanase to superficially bound pullulanase from about 3:4 to about 2:1 wherein said preparation is elaborated by a Klebsiella pneumoniae organism characterized as:

a. elaborating at least three times more pullulanase when amylopectin of a D.E. of less than 2.0 is employed as the sole carbohydrate source comparative to pullulanase elaboration in a nutrient medium wherein the major carbohydrate (on an eqivalent carbohydrate weight basis) is a carbohydrate source member selected from the group consisting of maltose, dextrose, lactose and pullulan;

b. elaborating pullulanase at a ratio of extracellular pullulanase to superficially bound cell pullulanase between about 2:3 to less than about 7:3 when said mutant is elaborated in a nutrient medium containing amylopectin as the sole carbohydrate source; and

c. elaborating pullulanase in a nutrient medium which contains dextrose as a sole carbohydrate source.

29. In a method of hydrolyzing the alpha-1,6-glucosidic linkages of a starch to a starch hydrolyzate with a pullulanase preparation, the improvement which comprises conducting the hydrolysis in the presence of a pullulanase preparation derived from Klebsiella organisms characterized as:

a. elaborating at least three times more pullulanase when amylopectin of a D.E. of less than 2.0 is employed as the sole carbohydrate source comparative to pullulanase elaboration in a nutrient medium wherein the major carbohydrate (on an equivalent carbohydrate weight basis) is a carbohydrate source member selected from the group consisting of maltose, dextrose, lactose and pullulan;

b. elaborating pullulanase at a ratio of extracellular pullulanase to superficially bound cell pullulanase between about 2:3 to less than about 7:3 when said mutant is elaborated in a nutrient medium containing amylopectin as the sole carbohydrate source; and

c. elaborating pullulanase in a nutrient medium which contains dextrose as a sole carbohydrate source.

3,963,576

METHOD FOR RENDERING BACTERIA DORMANT AND THE PRODUCT PRODUCED THEREBY

Frank L. Horsfall, III, Cleveland, and Barton Gilbert, University Heights, both of Ohio, assignors to General Environmental Science Corporation, Cleveland, Ohio

Filed Feb. 21, 1975, Ser. No. 551,702

Int. Cl.² C12K *1/00*

U.S. Cl. 195—59 **20 Claims**

1. A method for rendering an aqueous suspension of bacteria dormant which comprises,

a. growing bacteria under aerobic conditions in an aqueous media in such a manner that said bacteria includes at least one species of Pseudemonas bacteria which is capable of enzymatically reducing nitrate to nitrogen and one species of Rhodopseudomonas bacteria which is capable of photosynthetically forming red pigment;

b. dissolving an effective amount of at least one sulfide compound selected from the group consisting of the sulfides of sodium, potassium and mixtures thereof in said bacteria containing media; and

c. exposing said sulfide containing media under anaerobic conditions to light for a period of time sufficient to cause red photosynthetic pigment to develop in the Rhodopseudomonas bacteria.

11. An aqueous suspension of dormant bacteria obtained by:

a. growing bacteria under aerobic conditions in an aqueous media in such a manner that said bacteria includes at least one species of Pseudemonas bacteria which is capable of enzymatically reducing nitrate to nitrogen and one species of Rhodopseudomonas bacteria which is capable of photosynthetically forming red pigment;

b. dissolving an effective amount of at least one sulfide compound selected from the group consisting of the sulfides of sodium, potassium and mixtures thereof in said bacteria containing media; and

c. exposing said sulfide containing media under anaerobic conditions to light for a period of time sufficient to cause red photosynthetic pigment to develop in the Rhodopseudomonas bacteria.

3,963,577

LYTIC ENZYME AND METHOD OF PREPARING SAME

Ljubov Nikolaevna Shinkarenko, ulitsa Komsomolskaya, 64/66, kv. 4; Julia Semenovna Babenko, ulitsa Gogolya, 27a, kv. 35, and Evgeny Fedorovich Grigoriev, ulitsa Darvina, 40, kv. 1, all of Dnepropetrovsk, U.S.S.R.

Filed Sept. 16, 1974, Ser. No. 506,746

Claims priority, application U.S.S.R., Sept. 28, 1973, 1962088

Int. Cl.² C12K *1/00*

U.S. Cl. 195—62 **7 Claims**

1. A method for preparing a lytic enzyme comprising growing *Actinomyces recifensis* var. *lyticus* 2435 in a nutrient medium, containing sources of nitrogen, carbon and mineral salts at a temperature of 25°–28°C for 3–5 days, separating *Actinomyces recifensis* var. *lyticus* 2435 from the culture medium and then isolating the lytic enzyme from the culture medium.

3,963,578

STABILIZATION OF PHOSPHOENOL PYRUVATE CARBOXYLASE

Walter Brent Aitken; Ronald Wayne Bussian, both of Newark; Robert Carroll Menson, and Venkatachalam Narayanswamy, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1974, Ser. No. 535,139

Int. Cl.² C07G *7/02*; G01N *31/14*

U.S. Cl. 195—63 **6 Claims**

1. A stable aqueous enzyme composition wherein the enzyme is phosphoenol pyruvate carboxylase and the stabilizer comprises from about 1 to about 10 m molar aspartate, from about 0.02 to about 0.1 m molar ethylene diamine tetraacetic acid, from about 0.6 to about 3.75 molar ammonium sulfate, and sufficient sodium phosphate to maintain the pH of the composition at from 6.0 to 6.8.

3,963,579

MICROBIOLOGICAL PROCESS FOR THE PRODUCTION OF PEPSTATINS

Hamao Umezawa, Tokyo; Takeaki Aoyagi, Fujisawa; Akira Takamatsu, Yokohama, and Taiji Inui, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,795

Claims priority, application Japan, Oct. 17, 1973, 48-116665; Oct. 20, 1973, 48-118404

Int. Cl.² C21D *13/06*

U.S. Cl. 195—80 R **6 Claims**

1. A process for producing pepstatins having a high content of pepstatin A, which comprises adding at least one member selected from the group consisting of L-leucine plus L-valine, their salts and their esters in the form of pure crystals, crude powder or concentrated solution thereof to a reaction medium comprising a cell growth-promoting system containing a pepstatin-producing microorganism belonging to Streptomyces and also containing an energy source, said at least one member being added to the reaction medium in a total amount of 0.6 to 6.0% of the medium and in a ratio of L-leucine, its salts and its esters to L-valine, its salts and its esters of 0.5 : 1 to 2 : 1 based upon the calculation thereof as free acid, cultivating said microorganism in said reaction medium at a pH between 5 and 8 under aerobic conditions at a temperature between 25° and 35°C whereby pepstatins are produced, and recovering the resulting pepstatins from said reaction medium.

3,963,580

METHOD FOR DETERMINING THE SUITABILITY OF MILK FOR BACTERIAL FERMENTATION ACTIVITY

Ebenezer R. Vedamuthu, Bradenton, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Feb. 10, 1975, Ser. No. 548,239
Int. Cl.[2] C12K 1/04
U.S. Cl. 195—103.5 R 10 Claims

1. The method of determining the bacterial fermentation activity of skim milk with dairy starter cultures by using a colorimetric oxidation reduction sensitive dye, which comprises:

a. providing the colorimetric dye in at least two separate sterile openable and resealable containers with a standard unadulterated sterile milk in one container and a milk to be tested in the other container;

b. introducing dairy starter cultures of milk fermenting bacteria into the containers in an equivalent amount of at least about 10^8 cells per ml; and

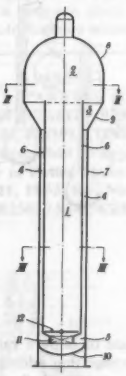
c. comparing the color change between the containers, wherein a fermentation defective milk is determined by a failure of the test milk to rapidly undergo the color change in relation to the color change in the standard milk container.

3,963,581

AIR LIFT FERMENTORS

Francesco Giacobbe, and Giampiero Longobardi, both of Rome, Italy, assignors to Compagnia Tecnica Industrie Petrolle S.p.A., Rome, Italy

Filed Feb. 24, 1975, Ser. No. 552,361
Claims priority, application Italy, Mar. 1, 1974, 48801/74
Int. Cl.[2] C12B 1/16
U.S. Cl. 195—142 6 Claims



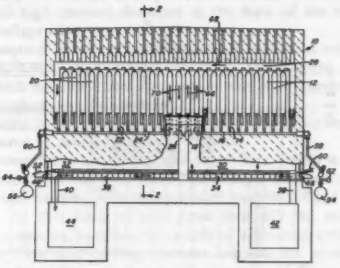
1. An air lift fermentor comprising a vessel including a hollow generally vertically disposed cylindrical body, a pair of spaced diaphragms located within said body and disposed generally longitudinally thereof and subdividing the interior of said body into a central fermentation zone and two lateral recirculation zones, said fermentation zone having an open lower end for receiving liquor to be fermented and said recirculating zones having upper and lower ends communicating with upper and lower ends of said fermentation zone for recirculating the liquor within said body, a heat exchanger mounted within a lower portion of said body, and an air distributor mounted within a lower portion of said fermentation zone for directing air substantially only into said fermentation zone.

3,963,582

METHOD AND APPARATUS FOR SUPPRESSING THE DEPOSITION OF CARBONACEOUS MATERIAL IN A COKE OVEN BATTERY

Edward J. Helm, and Linwood G. Tucker, both of Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1974, Ser. No. 527,395
Int. Cl.[2] C10B 43/00, 43/12
U.S. Cl. 201—2 11 Claims



1. In a regenerative coke oven battery the combination comprising,

a pair of flues operable alternately in on and off combustion condition,

a rich fuel gas supply main extending along said coke oven battery,

a second gas supply main extending along said coke oven battery adjacent said rich fuel gas supply main,

a first header and a second header for said flues positioned beneath said flues,

vertical riser ducts connected to said headers and extending vertically into said flues,

first connecting means connecting said rich fuel gas supply main to said headers,

second connecting means connecting said second gas supply main to said first connecting means,

gas flow control valve means in said first connecting means to control the flow of rich fuel gas from said rich fuel gas supply main to said headers,

said gas flow control valve means also operable to simultaneously supply both rich fuel gas and said second gas to one of said headers for admixture in said vertical duct to thereby dilute said rich fuel gas and suppress the deposition of carbonaceous material in said vertical riser ducts, and

means to supply said second gas under pressure to said first connecting means for admixture with said rich fuel gas in one of said headers to thereby dilute said rich fuel gas.

3,963,583

BATTERY OF HORIZONTAL COKE OVENS

Erich E. Pries, Agnesstrasse 53, 463 Bochum, Germany

Continuation of Ser. No. 279,039, Aug. 9, 1972, abandoned. This application July 2, 1975, Ser. No. 485,208
Int. Cl.[2] C10B 5/00
U.S. Cl. 202—263 7 Claims

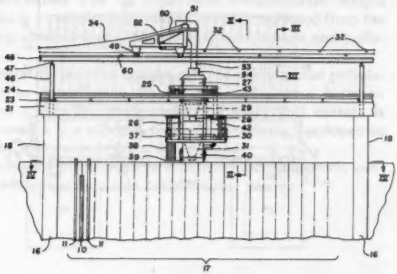
1. A coal charging apparatus in combination with a battery of horizontal coke ovens formed by a plurality of coke oven chambers which include an oven roof having a plurality of charging holes for loading coal into each oven chamber, the combination comprising:

a plurality of intermediate walls each of which extends horizontally between two adjacent oven chambers in a separate and independent manner to the masonry for said adjacent oven chambers, said intermediate walls dividing said battery of horizontal coke ovens into a plurality of

coke oven units each consisting of a plurality of coke oven chambers;

support beams integral with the horizontal ends of said intermediate walls and extending vertically therefrom, said support beams being mechanically isolated from said coke oven chambers by said intermediate walls;

vertically arranged anchoring pillars at the horizontal ends of said coke oven chambers for bracing the masonry forming said chambers, said support beams and said anchoring pillars projecting substantially equal distances



in a horizontal direction from the masonry for the battery of coke ovens;

a horizontal frame carried by said support beams in a spaced relation above said battery of horizontal coke ovens;

a coal charging car carried by said frame for positioning into a coal charging relation with a coke oven chamber, and

a plurality of hoppers carried by said transfer car for transferring coal through the charging holes of an oven chamber.

3,963,584

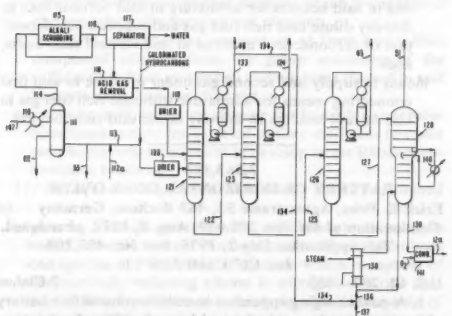
RECOVERY OF 1,2-DICHLOROETHANE FROM VINYL CHLORIDE PRODUCTION EFFLUENT

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Aug. 16, 1974, Ser. No. 498,081

Int. Cl.[2] B01D 3/34

U.S. Cl. 203—49 **3 Claims**



1. A process for recovering 1,2-dichloroethane from a mixture of 1,2-dichloroethane and at least one chlorinated hydrocarbon heavier than 1,2-dichloroethane selected from the group consisting of trichloroethane, tetrachloroethane, tetrachloroethylene, trichloroethylene, chlorinated butanes and chlorinated butenes, comprising:

introducing said mixture into a stripping column operated at an overhead temperature from about 225° to about 350°F, a bottoms temperature from about 270° to about 410°F and a pressure from about 20 psig to about 130 psig to separate and recover 1,2-dichloroethane from the mixture as overhead;

introducing into the bottoms of said stripping column, as stripping gas, a member selected from the group consisting of ethane, ethylene and mixtures of ethane and ethylene to strip 1,2-dichloroethane from said mixture, said stripping gas being introduced in a molar amount sufficient to reduce the partial pressure of 1,2-dichloroethane over the heavier chlorinated hydrocarbons and provide a bottoms containing no greater than 1 wt.% of 1,2-dichloroethane;

recovering as overhead from said stripping column 1,2-dichloroethane and said stripping gas; and

recovering a bottoms from the stripping column having a 1,2-dichloroethane content of no greater than 1 wt. %.

3,963,585

DISTILLATION OF TITANIUM TETRACHLORIDE IN SOLUTION WITH SELECTED AMINES

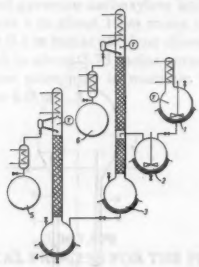
Gerhard Winter, Krefeld; Walter Deissmann, Krefeld-Bockum; Walter Gutsche, and Peter Woditsch, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 1, 1974, Ser. No. 465,954

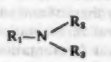
Claims priority, application Germany, May 22, 1973, 2325924

Int. Cl.[2] B01D 3/34

U.S. Cl. 203—38 **6 Claims**



1. In the purification of impure vanadium-containing titanium tetrachloride comprising adding an agent to said titanium tetrachloride to react with the vanadium impurity and thereafter removing purified titanium tetrachloride as distillate while leaving the vanadium impurity-agent reaction product in the distillation residue, the improvement which comprises employing as said agent an amine of the formula



in which

R_1 and R_2 each independently is selected from the group consisting of hydrogen, alkyl of up to 6 carbon atoms, alkenyl of up to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, and aryl, and

R_3 is selected from the group consisting of cycloalkyl of 5 to 7 ring carbon atoms, and aryl.

3,963,586

EXTRACTIVE DISTILLATION OF A DIMETHYL CARBONATE FEED WITH WATER

Alessandro Ginnasi, San Donato Milanese, and Giovanni Passoni, San Giuliano Milanese, both of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Oct. 25, 1974, Ser. No. 518,192
Claims priority, application Italy, Oct. 26, 1973, 30596/73
Int. Cl.² B01D *3/34, 3/38*
U.S. Cl. 203—96 1 Claim

1. The process of separating dimethyl carbonate from a mixture thereof with methyl alcohol and water through an extractive distillation comprising the steps of feeding said mixture to an intermediate zone of an extractive distillation column, feeding solvent water in an amount equal to at least 10 times the column reflux rate to said column at a point in proximity to its top, withdrawing a stream of methyl alcohol and water from the bottom of said column, withdrawing from the top of said column a stream having an organic phase containing dimethylcarbonate and an aqueous phase, and separating said organic phase from the aqueous phase.

3,963,587

PROCESS FOR ELECTROFORMING NICKEL FOILS

Douglas A. Kreckel, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1975, Ser. No. 578,782
Int. Cl.² C25D *1/02, 3/56*
U.S. Cl. 204—9 20 Claims

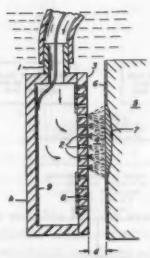
1. In a method of electroforming a smooth surface of nickel cobalt or alloy thereof on a conductive substrate from which it may subsequently be removed from a nickel sulfamate electroforming solution, the improvement comprising increasing the current density from zero at an average rate of between about 75 to 600 ASF per minute over the first 2 to 20 percent of the plating cycle to an ultimate current density of between about 200 and about 600 ASF, and the ultimate current concentration is between about 5 and about 15 amperes per gallon of electroforming solution.

3,963,588

COALESCENT-JET APPARATUS AND METHOD FOR HIGH CURRENT DENSITY PREFERENTIAL ELECTROPLATING

Richard C. Glenn, Hempfield Township, Westmoreland County, Pa., assignor to United States Steel Corporation

Filed Apr. 21, 1975, Ser. No. 570,061
Int. Cl.² B23K *28/00;* C25D *5/02*
U.S. Cl. 204—16 12 Claims



1. Apparatus for the high current density electroplating of a recessed configuration within a metal substrate, comprising

a. a housing member, which includes;

i. a front face composed of an electrically non-conductive material, said front face having a number of ports, closely spaced and properly distributed for the discharge of electrolyte in the form of coalescent jets,

ii. enclosure elements connected to said front face so as to form a substantially enclosed container, wherein one of said elements is fitted with inlet means for entrance of electrolyte into said housing, and

iii. a non-consumable electrode, supported within said housing and spaced rearwardly from said front face,

b. tank means for the storage of electrolyte,

c. conduit and pump means for conducting electrolyte from the tank means to said housing member, said pump means being of sufficient power to urge the electrolyte through said ports with an impingement force sufficient to support said high current densities at the base of the recessed configuration,

d. a source of electromotive force of sufficient voltage to effect said high current densities, the positive pole of which is in electrical connection with said non-consumable electrode, as anode,

e. means connecting the negative pole of said electromotive source to said substrate, as cathode,

f. means for maintaining said front face within a plating distance of less than three inches from said substrate,

said housing ports being spaced and distributed so that, in the plane of said front face, (i) the maximum spacing between the edges of adjacent ports is less than said plating distance and (ii) the normal distance from the border B_r around said recessed configuration to a border B_h around said ports, is about 0.5 to 1.5 times said plating distance, and wherein the total cross-sectional area of the port openings is no greater than about four times the cross-sectional area of said inlet means, whereby the jets of electrolyte issuing from said front face are caused to coalesce prior to substantially perpendicular impingement onto said recessed configuration.

3,963,589

PROCESS FOR THE MANUFACTURE OF A DECORATIVE ALUMINUM PRODUCT

Hachiro Kushida, Higashi-yamato; Tsuneji Takasugi, Iruma; Shinji Ikeda, Tokyo, and Takashi Shiono, Chofu, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,291
Claims priority, application Japan, Feb. 26, 1973, 48-22917; May 31, 1973, 48-60323; June 9, 1973, 48-64932; June 26, 1973, 48-72019
Int. Cl.² C25D *11/16, 11/18*
U.S. Cl. 204—29 6 Claims

1. A process for the manufacture of a decorative aluminum alloy product, comprising in combination:

a. bringing a plurality of different aluminum alloy material stocks into a mutually tightly contacting relationship so as to provide a composite stock;

b. subjecting this composite stock to a plastic deformation at least substantial part thereof, so as to provide therein an irregular flow pattern;

c. removing at least part of the surface of said composite stock by mechanical prefabrication so as to expose a new and decorative surface and to provide a semi-product;

d. subjecting said semiproduct to an anodically oxidizing step; and

e. subjecting at least part of the thus treated semiproduct to a mirror-finishing step.

3,963,590

PROCESS FOR ELECTROPLATING POLYOXYMETHYLENE

Edward Johnson Deyrup, Northeast, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1975, Ser. No. 552,999
Int. Cl.² C25D 5/56
U.S. Cl. 204—30 2 Claims

1. In a process for electroplating a shaped article of polyoxymethylene by the sequential steps of etching the surface of said article with an acid etchant, neutralizing the etched surface of said article with a base solution, treating said article with a catalyst for electroless deposition, depositing by electroless plating a metal coating on said article, and depositing by electroplating a metal coating on said article, the improvement which comprises contacting said article with a liquid comprising quinoline or γ-butyrolactone before etching the surface of said article.

3,963,591

METHOD OF COLORING OF ANODIZED ALUMINUM AND ALUMINUM ALLOYS BY ELECTROLYTIC TREATMENT IN THE METAL SALT SOLUTIONS

Walter Zweifel, Neuhausen am Rheinfall, and Fritz Schneeberger, Schaffhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 411,437, Oct. 31, 1973, abandoned, which is a continuation of Ser. No. 262,009, June 12, 1972, abandoned. This application Aug. 25, 1975, Ser. No. 607,250
Claims priority, application Switzerland, June 17, 1971, 8845/71
Int. Cl.² C25D 11/18
U.S. Cl. 204—35 N 10 Claims

1. In an improved method for coloring anodically produced oxide layers on aluminum and aluminum alloys by electrolytic treatment in a metal salt solution electrolyte containing nickel salts and/or cobalt salts and being operable to obtain bronze colorations normally obtained in said oxide layers with the use of said salts,

the steps comprising

adding a quantity of copper salt such as to establish, in the solution, a concentration of about 0.02 to about 0.75 grams of copper per liter of solution, said concentration being sufficiently large to promote uniformity of color and sufficiently small to restrain the occurrence of reddish tint normally associated with the presence of copper ions in said electrolyte.

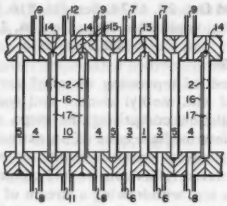
3,963,592

METHOD FOR THE ELECTROLYTIC PRODUCTION OF ALKALI

Olle Lindström, Taby, Sweden, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 293,623, Sept. 29, 1972, Pat. No. 3,864,236. This application Sept. 30, 1974, Ser. No. 510,210
Int. Cl.² C25B 1/16, 1/02, 1/26, 1/22
U.S. Cl. 204—98 2 Claims

1. In the process for electrolyzing an aqueous solution of an alkali metal chloride to form an alkali metal hydroxide at the cathode and chlorine at the anode by the oxidation of chloride ions in the anolyte, the improvement which comprises introducing hydrogen gas at the anode, preferentially anodically oxidizing said hydrogen gas in the presence of a catalyst to hydrogen ions by passing said hydrogen gas through a porous anode containing the catalyst into the anolyte and reacting the thus-formed hydrogen ions with the chloride ions in the anolyte, the porous anode through which the hydrogen gas is passed being formed in two layers, said first layer being a porous sintered coarse layer of platinized titanium and said second layer being a porous sintered finer layer of titanium,



the hydrogen gas being passed initially through said first layer and then through said second layer into the anolyte.

3,963,593

ELECTRODES HAVING SILICIDE SURFACE

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 289,700, Sept. 15, 1972, Pat. No. 3,862,023. This application Nov. 13, 1974, Ser. No. 523,397
Int. Cl.² C25B 1/34, 11/08, 11/10
U.S. Cl. 204—98 10 Claims

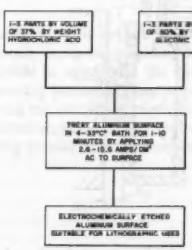
1. In a method of electrolysis comprising the steps of feeding a brine to an electrolytic cell and causing an electrical current to flow from an anode of said electrolytic cell to a cathode of said electrolytic cell, the improvement wherein said anode consists of a surface of an electroconductive, electrocatalytic silicide chosen from the group consisting of the silicides of the platinum group metals, on a valve metal substrate.

3,963,594

ELECTROCHEMICAL TREATMENT OF ALUMINUM SURFACES WITH AN AQUEOUS SOLUTION OF HYDROCHLORIC ACID AND GLUCONIC ACID

Peter Brasko, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed June 3, 1975, Ser. No. 583,438
Int. Cl.² C25F 3/00
U.S. Cl. 204—129.95 6 Claims


1-3 PARTS BY VOLUME OF 37% BY WEIGHT HYDROCHLORIC ACID
1-3 PARTS BY VOLUME OF 50% BY WEIGHT GLUCONIC ACID
TREAT ALUMINUM SURFACE IN 4–33°C° BATH FOR 1–10 MINUTES BY APPLYING 0.6–15.5 AMPS/DM² AC TO SURFACE
ELECTROCHEMICALLY ETCHED ALUMINUM SURFACE SUITABLE FOR LITHOGRAPHIC USES

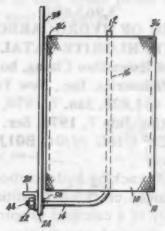
1. A process for treatment of aluminum to provide a roughened surface thereon suitable for lithographic uses which comprises electrolytically etching the aluminum with a mixture of hydrochloric acid and gluconic acid.

3,963,595

ELECTRODE ASSEMBLY FOR AN ELECTROLYTIC CELL

Peter A Danna, Devonshire, Bermuda, assignor to Olin Corporation, New Haven, Conn.

Filed June 24, 1974, Ser. No. 482,301
Int. Cl.² C25B 1/26, 1/34, 9/02, 11/02
U.S. Cl. 204—258 9 Claims



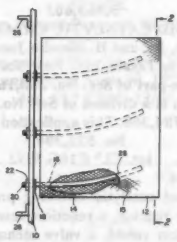
1. An electrode assembly comprising:
a. an electrode plate positioned vertically,
b. an electrically-conductive surface, and
c. at least one conductive support having a first section and a second section, said first section being attached to and substantially perpendicular to said electrode plate, said first section being spaced from and not attached to said electrically-conductive surface, said second section being substantially parallel to said electrode plate, and attached to said first section and to said electrically-conductive surface, said conductive support conducting electric current between said electrode plate and said electrically-conductive surface.

3,963,596

ELECTRODE ASSEMBLY FOR AN ELECTROLYTIC CELL

Morton S. Kircher, Oakville, Canada, assignor to Olin Corporation, New Haven, Conn.

Filed June 24, 1974, Ser. No. 482,296
Int. Cl.² C25B 1/26, 1/34, 9/02, 11/02
U.S. Cl. 204—258 21 Claims



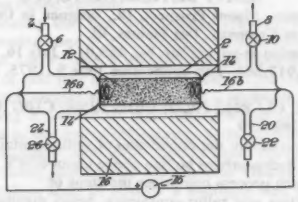
1. An electrode suitable for use in a cell for the electrolysis of alkali metal chloride solutions which comprises:
a. two vertical electrode surfaces positioned in parallel and having a space between said electrode surfaces,
b. at least one conductive support attached to said electrode surfaces and positoned in said space between and parallel to said electrode surfaces, said conductive support having a portion having a curvature of from about 2 to about 30 degrees from the horizontal, and
c. a gas directing element positioned immediately below said conductive support and attached to a side of said electrode surfaces.

3,963,597

ELECTRICALLY REGENERATIVE OXYGEN TRAP

Michel Kleitz; Pierre Fabry, both of Grenoble, and Jacques Fouletier, St. Martin d'Heres, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Mar. 25, 1974, Ser. No. 454,705
Claims priority, application France, Mar. 30, 1973, 73.11572
Int. Cl.² C25B 9/00; H01J 7/18
U.S. Cl. 204—277 30 Claims



1. An electrically regenerable oxygen trap, having a closed enclave, the internal space thereof being free of oxygen or gaseous oxygen containing compounds, means for admitting into the enclave a gas containing traces of oxygen to be eliminated; means for evacuating the purified gas from the enclave, a body of material located within the enclave, and formed of a solid solution of metal oxides in a reduced state and having a strong affinity for oxygen, said solution of metal oxides being of the type which upon absorption of oxygen yields a solid solution of metal oxides, having both an ionic conductivity through O^{2-} ions and a nonzero electrical conductivity.

3,963,598

FLASH HYDROGENATION OF COAL

Bernard Manowitz, Brightwaters; Meyer Steinberg, Huntington Station; Thomas V. Sheehan, Hampton Bays; Warren E. Winsche, Bellport, and Chad J. Raseman, Setauket, all of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 15, 1974, Ser. No. 514,876
Int. Cl.³ C10G 1/02
U.S. Cl. 208—8 3 Claims

1. A process for the hydrogenation of coal to maximize the production of liquid hydrocarbons, comprising contacting in a rotating fluidized bed substantially dry powdered coal having a particle size in the range of about 50–500 microns with hydrogen gas at temperatures to produce a reaction temperature between about 500° C and 800° C, at a pressure in the range of about 68 to 280 atmospheres for a coal residence time of not in excess of five seconds and hydrogen contact time not in excess of 0.2 sec to produce liquid hydrocarbons, followed by rapid cooling to a temperature sufficiently low to prevent further cracking of the liquid products.

3,963,599

RECOVERY OF BITUMEN FROM AQUEOUS STREAMS VIA SUPERATMOSPHERIC PRESSURE AERATION

H. James Davitt, Edmonton, Canada, assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 11, 1974, Ser. No. 522,379
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE 20 Claims

2. An improved process for recovering bitumen from tar sands comprising:

a. forming a mixture of tar sands and water;
b. aerating said mixture in an aeration zone at a pressure above atomspheric;
c. suddenly reducing the pressure on said mixture;
d. settling said aerated mixture at said reduced pressure to provide a recoverable upper bitumen froth layer, a sand tailings layer, and a middlings layer containing bitumen, clay, water, and some silt; and
e. recovering said froth layer.

3,963,600

COMBINATION PROCESS FOR THE CONVERSION OF HEAVY DISTILLATES TO LPG

Lee Hilfman, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 489,014, July 16, 1974, Pat. No. 3,917,562. This application June 9, 1975, Ser. No. 585,288

Int. Cl.² B01J *29/22*; C01G *13/08*; C10G *37/02*

U.S. Cl. 208—59 **9 Claims**

1. A process for the conversion of sulfur-containing, heavy distillate hydrocarbons boiling above about 600°F. to produce LPG, which process comprises the steps of:
a. reacting said sulfur-containing, heavy distillate in a first reaction zone containing a catalytic composite comprising a porous carrier material, a Group VI-B metal component and a Group VIII metal component at hydrocracking conditions selected to convert the heavy distillate into lower boiling hydrocarbons;
b. reacting at least a portion of said lower boiling hydrocarbons containing less than about 50 ppm. sulfur in a second reaction zone containing a catalytic composite comprising a Group VIII metal component combined with an alumina carrier material containing a uniform distribution of finely divided mordenite particles which catalytic composite is prepared by commingling said mordenite with an aluminum halide sol, gelling the resultant mixture then calcining the gelled mixture wherein said alumina carrier material contains from about 20 to about 30 weight percent mordenite, at hydrocracking conditions selected to produce LPG; and,
c. recovering said LPG from the resulting first and second reaction zone effluents.

3,963,601

HYDROCRACKING OF HYDROCARBONS WITH A CATALYST COMPRISING AN ALUMINA-SILICA SUPPORT, A GROUP VIII METALLIC COMPONENT, A GROUP VI-B METALLIC COMPONENT AND A FLUORIDE

Lee Hilfman, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 390,146, Aug. 20, 1973, abandoned. This application July 15, 1974, Ser. No. 488,348

Int. Cl.² C10G *13/02*, *23/04*

U.S. Cl. 208—111 **3 Claims**

1. A process for the hydrocracking of a hydrocarbon at a pressure of about 400 psig. to about 3000 psig.; a temperature of about 400°F. to about 900°F.; a LHSV of about 0.1 $hr.^{-1}$ to about 10 $hr.^{-1}$; and hydrogen circulation rates of about 1000 to about 15,000 s.c.f. per barrel of charge which comprises contacting the hydrocarbon with a catalyst consisting essentially of an alumina-silica support containing from about 10 weight percent to about 90 weight percent alumina, a Group VIII metallic component present in an amount of from about 0.01 percent to about 10 percent by weight of said catalyst, a Group VI-B metallic component present in an amount of from about 0.01 percent to about 20 percent by weight of said catalyst and a fluoride, said composition having been prepared by initially impregnating said support with a Group VIII metal compound and a Group VI-B metal compound, drying at a temperature of from about 200°F to about 600°F and calcining at a temperature of about 700°F to about 1100°F for a period of about 0.5 to about 10 hours the resultant impregnated composite and then impregnating said composite with aqueous hydrofluoric acid solution to associate said fluoride with said catalyst, followed by further calcining, said catalyst having a surface area of from about 50 to about 700 square meters per gram, a pore diameter of about 20 to about 300 Angstroms, and an apparent bulk density within the range of from about 0.10 to about 0.30 gram/cc.

3,963,602

CRACKING OF HYDROCARBONS WITH SEPTECHLORITE CATALYSTS

Alan C. Wright, and Hsien-Dao Chang, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 431,028, Jan. 7, 1974, Pat. No. 3,917,541. This application July 7, 1975, Ser. No. 593,922

Int. Cl.² C10G *11/04*; B01J *8/24*

U.S. Cl. 208—111 **2 Claims**

1. The process of cracking hydrocarbons which comprises contacting them under cracking conditions with a catalyst consisting essentially of a calcined precursor synthetic septechlorite having a chemical composition represented by the following:

$$(6-x)\ A^{2+}O \cdot x\ L_2^{3+}O_3 \cdot (4-x)\ SiO_2 \cdot (4-y)\ H_2O \cdot yHF$$

wherein:
A is Ni, Mg, Co, Fe^{2+}, Cu^{2+}, Mn^{2+}, Zn, or mixtures thereof:
L is Al, Cr, Fe^{3+}, or mixtures thereof:
$0 \leq x \leq 2$
$0 \leq y \leq 1$
$x + y \geq 0.1$
$0 \leq Co \leq 5.75$
$0 \leq Fe^{2+} \leq 5.25$
$0 \leq Zn \leq 4$
$4 \leq (Ni + Mg + Co + Fe^{2+} + Cu + Mn + Zn) \leq 6$
$Cu \leq 0.5$
$Mn \leq 0.5$
$(Cr + Ni + Co + Cu + Mn) > 0.1$
$Fe^{3+} \leq 1$,
said precursor septechlorite prior to calcining being a 1:1 trioctahedral phyllosilicate having equal degrees of trivalent ion substitution in both octahedral and tetrahedral layers, and thus having a balanced framework with no exchangeable ions needed for neutrality.

3,963,603

FLUID CATALYTIC CRACKING

Dorrance P. Bunn, Jr., and H. Blandin Jones, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 368,165, June 8, 1973, abandoned, which is a division of Ser. No. 182,030, Sept. 20, 1971, Pat. No. 3,784,360. This application Nov. 11, 1974, Ser. No. 522,394

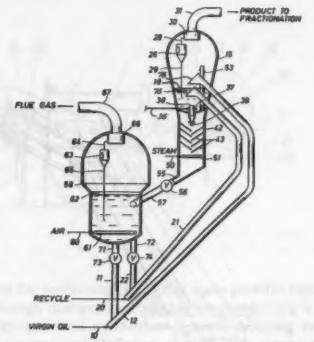
Int. Cl.² C10G *9/32*

U.S. Cl. 208—164 **10 Claims**

1. In a fluidized catalytic cracking process comprising a dilute phase riser reactor, a reaction vessel, a stripping zone below said reaction vessel; a valve means responsive to the weight of catalyst connecting the lower portion of said reaction vessel with the upper portion of said stripping zone, and a regeneration zone, wherein regenerated catalyst and hydrocarbon charge are combined in the lower portion of said riser reactor under catalytic cracking conditions, wherein catalyst and hydrocarbon vapors discharge downwardly from the upper end of said riser reactor into said reaction vessel at a point intermediate to the height of said reaction vessel for separation into a dense phase fluidized catalyst bed and a hydrocarbon vapor phase containing a minor amount of entrained catalyst, wherein hydrocarbon vapor is recovered overhead from said reaction vessel, and wherein catalyst from said dense phase bed is transferred via said valve means from the

lower portion of said reaction vessel into said stripping zone at a rate equivalent to the rate catalyst enters said reaction vessel; the improvement which comprises:

a. maintaining, by action of said valve means responsive to the weight of catalyst, a preselected weight inventory of catalyst in said dense phase fluidized bed such that at a bulk density of about 35 lb/cu. ft. the upper surface of said dense phase fluidized catalyst bed is below said riser discharge and at a bulk density of about 18 lb/cu. ft. the upper surface of said dense phase fluidized catalyst bed is above said riser discharge;



b. Charging a fluidization vapor to the lower portion of said reaction vessel at a rate sufficient to maintain a superficial vapor velocity within said dense phase fluidized bed from about 1.5 ft/sec. to about 3.4 ft/sec. and to maintain a bulk density of said dense phase fluidized catalyst bed within the range of from about 35 lb/cu. ft. to about 18 lb/cu. ft.; and

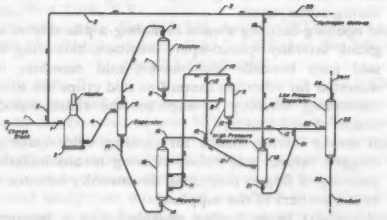
c. adjusting the flow of fluidization vapor for adjusting the bulk density of said dense phase fluidized catalyst bed within the range of about 35–18 lb/cu. ft., and obtaining a selected conversion of hydrocarbon within said reaction vessel.

3,963,604

COMBINATION PROCESS FOR HYDROREFINING AN ASPHALTENIC HYDROCARBONACEOUS CHARGE STOCK

Leroi E. Hutchings, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 413,132, Nov. 5, 1973, abandoned. This application Sept. 30, 1975, Ser. No. 618,200
Int. Cl.² C10G *23/00*
U.S. Cl. 208—211 **3 Claims**



1. A combination process for hydrorefining an asphaltenic hydrocarbonaceous charge stock containing sulfurous compounds and nitrogeneous compounds to produce a fuel oil product containing less than 1% by weight of sulfur which process comprises the steps of:

a. admixing said charge stock with hydrogen in an amount of from 2000 to about 6000 S.C.F./bbl. and heating the resulting mixture to a temperature of 600°F. to 800°F. and a pressure of about 1000 psig. to about 4000 psig.;

b. separating the heated mixture in a first separation zone to provide a first vapor phase and a first liquid phase containing hydrogen dissolved therein;

c. hydrorefining said first vapor phase with a first hydrorefining catalyst and substantially at said pressure in a first hydrorefining zone to obtain a first hydrorefined effluent;

d. hydrorefining the first liquid phase with a second hydrorefining catalyst in a second hydrorefining zone comprising a fixed bed of said second catalyst to obtain a second hydrorefined effluent;

e. separating said first hydrorefined effluent, in a second separation zone at a temperature of from about 60°F. to about 140°F., and a pressure substantially the same as that of said first hydrorefining zone to provide a hydrogen-rich second vapor phase and a second liquid phase;

f. passing a portion of said hydrogen-rich second vapor phase to said hydrorefining step (d) in an amount of from 200 to about 2000 S.C.F./bbl. of liquid charge;

g. separating said second hydrorefined effluent in a third separation zone to provide a hydrogen-rich third vapor phase and a third liquid phase; and,

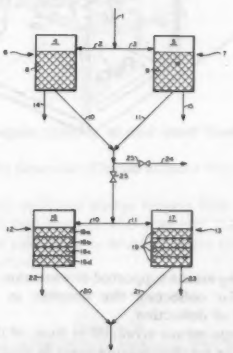
h. recovering said fuel oil product from said second liquid phase and said third liquid phase.

3,963,605

COATED SHAKER SCREEN APPARATUS AND METHOD

Ed O. Seabourn, Great Yarmouth, England, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1974, Ser. No. 451,024
Int. Cl.² B03B *9/00*
U.S. Cl. 209—2 **6 Claims**



1. A metal substrate comprising openings to form a screen, said substrate coated with a cured blend comprising from about 99 to 25 percent by weight poly(arylene sulfide) and from about 1 to 75 percent by weight fluoroethylene.

3,963,606

SEMI-AUTOMATIC ADJUSTING DELAY FOR AN ELECTRONIC PARTICLE SEPARATOR

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed June 3, 1974, Ser. No. 475,670
Int. Cl.² B07C *5/34*
U.S. Cl. 209—3 **13 Claims**

1. A device for adjusting an electrical delay to a time interval between two occurrences of a moving particle in an apparatus for classifying particles suspended in a fluid, in which said apparatus comprises:

A. nozzle means including a nozzle connected to a fluid reservoir for generating a fluid jet,

B. means connected to the nozzle means for pulsating the fluid jet so as to separate same into droplets at a break-off point,

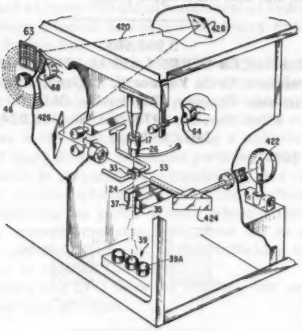
C. sensing means located at the outlet of the nozzle means for producing an electric quantity in response to a selected parameter of a passing particle,

D. means disposed adjacent the fluid downstream of the sensing means for charging each droplet with a potential related to the electric quantity produced by the sensing means,

E. electrical delay means, the input thereof being coupled to the sensing means and the output thereof being coupled to the charging means,

F. first and second means associated with the electrical delay means for adjusting the delay of said electrical delay means,

G. means situated downstream of the charging means for deflecting each droplet by an amount related to said parameter of the particle,



H. collecting means supported downstream of the deflecting means for collecting the droplets in relation to the amounts of deflection,

I. microscope means arranged in front of the nozzle means and means for illuminating same in synchronization with said pulsating means,

J. movable scale means associated with the microscope means and including a graticule having a reference line and at least one nonparallel comparison line,

K. position adjusting means connected to the nozzle means for raising or lowering the nozzle until the image of the breakoff point of the jet is on said reference line,

L. graticule adjusting means associated with the graticule for aligning said at least one comparison line with the image of at least one of said droplets, and

M. means for coupling said first and second delay adjusting means to said position and graticule adjusting means, respectively.

wherein, upon completion of said adjustments, the image of the train of droplets is rendered visible, stationary and measurable, and the electrical delay is substantially equal to the time interval between the passage of a particle through the sensing means and the arrival thereof at the break-off point.

3,963,607

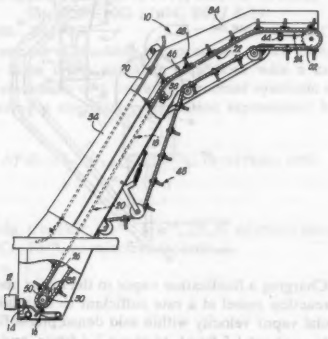
LOADING AND CLEANING ELEVATOR FOR HARVESTERS

Thomas A. Bedwell, Providence, and Doyle D. Zollinger, Millville, both of Utah, assignors to Hesston Corporation, Hesston, Kans.

Filed May 28, 1974, Ser. No. 473,997

Int. Cl.² B65G *19/18*

U.S. Cl. 209—73 **2 Claims**



1. In crop conveying apparatus;

a support having a normally upper crop engaging surface upon which crops are moved during conveyance; and

a mover shiftable along the entire length of said support and including pushing structure having a forwardly facing crop engaging portion above said surfaces and extending continuously across the support for tumbling said crops while simultaneously advancing the same to dislodge refuse therefrom,

said support being provided with means defining a plurality of refuse discharge openings along the path of travel of the crops for removing refuse dislodged from said crops during conveyance,

said opening-defining means including a plurality of elongated, laterally spaced-apart members extending along said path beneath said mover, said members being mounted for vibration thereof as said crops are tumbled therealong whereby to augment the refuse-dislodging action of said mover,

said mover having means for clearing said openings of clogged refuse, said refuse-clearing means including a plurality of fingers projecting downwardly between adjacent members of the support,

said support being further provided with a transversely extending undersupport for said members,

each of said members having a downwardly extending ear securing said members to said undersupport in upwardly-spaced relationship to present a clearance trough for said fingers permitting the latter to pass unhindered over said undersupport.

3,963,608
APPARATUS FOR THE TREATMENT OF SYNTHETIC RESIN POWDER

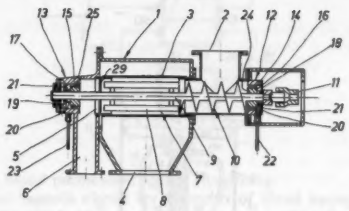
Adolf Zimmermann; Adolf Lesk; Walter Jordan, all of Osterburken, and Rudi Baumann, Rosenberg, all of Germany, assignors to AZO-Maschinenfabrik Adolf Zimmermann, Germany

Filed July 30, 1974, Ser. No. 493,107

Claims priority, application Germany, July 31, 1973, 2338731

Int. Cl.² B07B 1/20

U.S. Cl. 209—300 **16 Claims**



1. Apparatus for reclaiming synthetic resin powder contaminated with foreign matter, said apparatus comprising a substantially horizontal and cylindrical screen, housing means housing said screen and defining a discharge opening for synthetic resin powder passing through said screen, feeding means for feeding contaminated synthetic resin powder to the interior of said screen, recovery means for withdrawing foreign matter too large to fit through said screen from the interior of said screen, rotor means in said screen comprising at least two spaced and generally parallel bars connected to a shaft, bearing means mounting said rotor means for rotation in said screen, said bearing means including fluid seal means for preventing synthetic resin powder from coming into contact with engaging parts of said bearing means by the flow of a fluid, and a resilient disc mounted on said shaft, said bearing means constructed so that fluid from said fluid seal means (a) flows away from engaging parts of said bearing means so that synthetic resin powder is blown away from said engaging parts and (b) acts on said resilient disc to seal off any communication between the interior of said screen and the engaging parts of said bearing means.

3,963,609
INTEGRAL CIRCULAR WASTEWATER TREATMENT PROCESS

Louis Maynard La Clair, Grand Island, N.Y.; John Ruben McWhirter, Westport, Conn., and William Lawrence Ross, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 347,398, April 2, 1973, Pat. No. 3,890,231. This application Feb. 4, 1975, Ser. No. 546,908

Int. Cl.² C02C 1/06

U.S. Cl. 210—7 **5 Claims**

1. In a method for treatment of BOD-containing waste water by aeration with at least 50% oxygen gas in the presence of recycled activated sludge for biological oxidation to reduce the BOD content of said waste water in at least two covered aeration zones wherein the oxygen feed gas, waste water and activated sludge are mixed and one fluid is simultaneously recirculated in a first aeration zone, oxygen partially depleted gas and partially oxygenated liquor from the first aeration zone are each separately introduced to a second aeration zone for continuous mixing and fluid recirculation therein, and the further oxygenated liquor from the final aeration zone having a reduced BOD content is separated into effluent water and activated sludge in a clarification zone with at least part of the sludge being returned to the first aeration zone as said recycled sludge, the improvement comprising:

a. mixing said oxygen feed gas, waste water and recycled activated sludge in an arcuate first aeration zone;

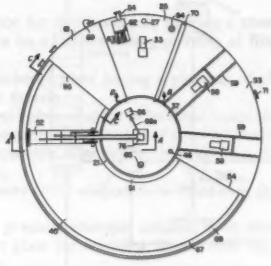
b. mixing oxygen partially depleted gas and partially oxygenated liquor in a circular final aeration zone;

c. flowing the further oxygenated liquor radially across an arcuate clarification zone of between 90° and 330° arc length from an inner smaller diameter inlet arc to an outer concentric larger diameter liquid effluent discharge arc at radial velocities and volumetric flow rates such that V_g/V_i is between 0.1 and 0.5, wherein

$$\frac{V_g}{V_i} = \left(\frac{Q}{Q+R}\right)\left(\frac{R_i}{R_g}\right);$$

and

V_g = radial liquid velocity at said outer concentric larger diameter liquid effluent discharge arc,



V_i = radial liquor velocity at said inner smaller diameter inlet arc,

Q = volumetric flow rate of liquid effluent from clarification zone,

R = volumetric activated sludge recycle flow rate,

R_i = radius of said inner smaller diameter inlet arc, and

R_g = radius of said outer concentric larger diameter liquid effluent discharge arc.

3,963,610
METHOD OF REMOVING PHENOL FROM WASTE WATER

Bruno Hauschulz, Gladbeck; Heinrich von Barneveld, Kirchhellen; Wilfried Jordan; Josef Mertmann, both of Gladbeck; Gerhard Rasner, Recklinghausen, and Harri Brenienek, Gladbeck, all of Germany, assignors to Phenolchemie GmbH, Gladbeck, Germany

Filed Oct., 1973, Ser. No. 381,126

Claims priority, application Germany, July 20, 1972, 2235493

Int. Cl.² B01D 11/04

U.S. Cl. 210—21 **5 Claims**

1. Method of dephenolizing waste waters occurring in the manufacture of phenol by the cumene process using cumene as extractant which comprises treating the cumene which is used for extracting the phenol from the waste water and which thereafter is washed with sodium hydroxide to remove the phenol, prior to this washing with an aqueous solution of 1 to 20 wt-% sodium carbonate.

3,963,611

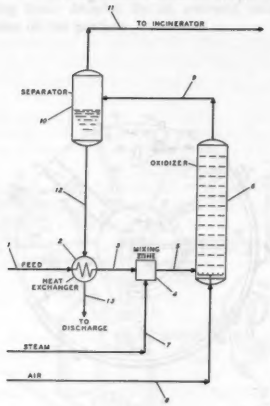
OXIDATION PROCESS FOR IMPROVING THE ENVIRONMENTAL QUALITY OF WATER CONTAINING SULFUR AND/OR INORGANIC SUB-SIX-SULFUR-CONTAINING IMPURITIES

Walter Dardenne-Ankringa, Jr., El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 410,147, Oct. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 306,116, Nov. 10, 1972, abandoned. This application Mar. 4, 1975, Ser. No. 555,332

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—63 R 10 Claims



1. In the method of improving a water stream containing inorganic sub-six-sulfur-containing impurities by oxidizing said sulfur to sulfate using a gas comprising molecular oxygen, the improvement which comprises using as feed a stream containing said impurity in an amount, calculated as sulfur and per million parts (weight) of water, in the range from about 100 to 20,000 parts (weight), and said impurity being at least one of the group consisting of elemental sulfur and inorganic compounds consisting of sub-six sulfur plus at least one element of the group consisting of oxygen, hydrogen, and carbon, and water-soluble salts of acids included in said compounds, and oxidizing said sub-six sulfur to sulfate by contacting said stream with molecular oxygen for a period in the range from about 0.1 to 5 hours and sufficient for at least a 90 percent conversion of said sub-six sulfur to sulfate, said oxidation being effected by carrying out the contacting in the presence of at least enough strong base to provide at least one equivalent of hydroxyl ion per gram atom of sub-six sulfur in said impurity, said contacting being effected in the substantial absence of heavy metal sub-six sulfur oxidation catalysts and said oxidation being effected by maintaining the stream in the liquid phase:

a. at a standard pH of at least about 9.6;

b. at a temperature in the range of from about 90° to 180°C; and

c. at a partial pressure of molecular oxygen gas of at least about 0.5 atmosphere.

3,963,612

SYSTEM OF WATER PURIFICATION AND PRODUCT DISTRIBUTION

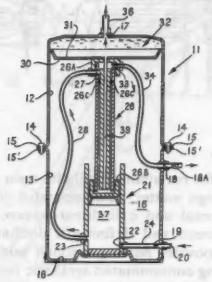
Charles W. Gossett, 14025 Crenshaw Blvd., Hawthorne, Calif. 90250, and William J. Dauenhauer, P.O. Box 487, Gualala, Calif. 95445

Filed Sept. 16, 1974, Ser. No. 506,739

The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.

Int. Cl.[2] B01D *13/00, 31/00*

U.S. Cl. 210—143 5 Claims

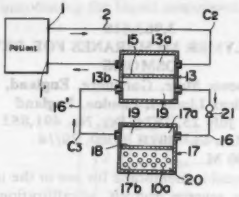


1. A system of water purification and product distribution comprising, in combination with a water service line, a hollow vessel having an inlet communicating with said water service line and also having a pair of outlets including a product outlet and a drain outlet, a cylinder fixedly secured within said vessel; said cylinder having an inlet port communicating with the inlet of said vessel and also having an outlet port, a reservoir supported within said vessel and in communication with said product outlet of said vessel, a reverse osmosis module mounted for reciprocation within said cylinder; said module having an inlet in communication with said water service line through said outlet port of said cylinder and also having a pair of outlets including a product outlet in communication with said reservoir and a drain outlet for repetitively delivering nearly pure product water through said product outlet thereof to said reservoir and for delivering separated out impurities through said drain outlet thereof to said drain outlet of said vessel, upon the downward movement of said module into said cylinder to close said outlet port of said cylinder and thereby shut off supply of raw water from said water supply line, a valve controlled drain line establishing communication between said drain outlet of said vessel and said drain outlet of said module for creating back pressure therein, and a valve-controlled product dispensing line in communication with said reservoir through said product outlet of said vessel,; depletion of the supply of nearly pure product water in said reservoir by opening said dispensing line reducing the hydraulic pressure above said module and increasing hydraulic pressure below the same to effect upward movement of said outlet port of said cylinder to open said outlet port of said cylinder and said inlet of said module thereby causing flow of raw water into said module and the refilling of said reservoir with nearly pure product water from said module.

3,963,613
BLOOD PURIFICATION MEANS

Ichiro Chibata, Saita; Tetsuya Tosa, Kyoto, and Takao Mori, Takatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Dec. 26, 1974, Ser. No. 536,641
Claims priority, application Japan, Dec. 29, 1973, 49-608; Dec. 29, 1973, 49-609
Int. Cl.² B01D 31/00
U.S. Cl. 210—195 R 2 Claims

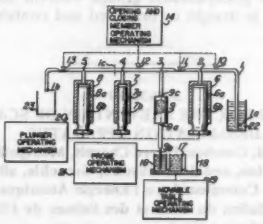


1. A blood purification means comprising
a first cannula circuit for transport of blood having both ends which are adapted to be connected to the blood stream of a patient to be treated,
a hemodialysis unit having a first dialysate provided in said first circuit, the first dialysate being effected with the blood of said first cannula circuit through a semi-permeable membrane,
a second cannula circuit for transport of the first dialysate of said hemodialysis unit having both ends connected to said hemodialysis unit,
a dialyzer having a second dialysate provided in said second cannula circuit, the second dialysate containing additions of fumarate and an aspartase preparation and being selectively effected with said first dialysate through a semipermeable membrane which permits diffusion therethrough of ammonia molecules, but not of aspartic acid molecules, and
a pump for driving said first dialysate around said second cannula circuit.

3,963,614
APPARATUS FOR REMOVING UNNECESSARY COMPONENTS FROM SAMPLES

Kyoichi Ozawa, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 5, 1971, Ser. No. 195,996
Claims priority, application Japan, Nov. 9, 1970, 45-97877
Int. Cl.² B01D 15/08
U.S. Cl. 210—198 C 28 Claims

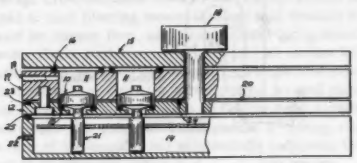

OPENING AND CLOSING MEMBER OPERATING MECHANISM
PLUNGER OPERATING MECHANISM
PROBE OPERATING MECHANISM
NOMBLE TUBE OPERATING MECHANISM

1. An apparatus for removing unnecessary components from samples, comprising a column filled with a porous material which allows the unnecessary components in a sample to pass therethrough but retains a component which it is desired to analyze, a probe connected with one end of said column, means for sucking the sample through said probe into said column, means for sucking an auxiliary liquid through said probe and said column successively after the suction of the sample thereby urging the unnecessary components to pass through the column while retaining the component desired to be analyzed within said column, and means for passing a discharging liquid through said column and said probe to discharge the component desired to be analyzed from said column.

3,963,615
MULTIFILTRATION UNIT

Chris J. Plakas, 8510 Conover Place, Alexandria, Va. 22308

Filed Oct. 31, 1974, Ser. No. 519,621
Int. Cl.² B01D 35/02
U.S. Cl. 210—203 4 Claims



1. A device for simultaneously filtering a plurality of separate samples on a corresponding plurality of filters, comprising:
A. a chambered plate having a plurality of chambers in a pattern therein,
B. a support plate adapted to be fitted under the chambered plate comprising a plurality of recessed means for mounting disposable filter holders therein in a corresponding pattern,
C. a pressure cover adapted to be fitted over the chambered plate,
D. a low pressure chamber adapted to be fitted under the support plate for receiving filtrate from the plural filter holders,
E. first sealing means fitted between the chambered plate and the pressure cover for separately sealing off each of the plurality of chambers at its end adjacent to the pressure cover,
F. means for fitting together adjacent sides of the chambered plate and the support plate, thereby separating from the ambient air an upper chamber comprising all of said plurality of chambers and interconnecting undercut spaces,
G. second sealing means in each of the plurality of recessed means for mounting filter holders for sealing each recessed means when a filter holder or plug is inserted therein, thereby preventing flow of air between the upper chamber and the low pressure chamber except through the filters,
H. removable manual means for tightening the support plate, the chambered plate and the pressure cover into a tightly sealed sandwich for use on top of the low pressure chamber,
I. means for introducing pressurized air into the upper chamber, and
J. means for removing air from the low pressure chamber.

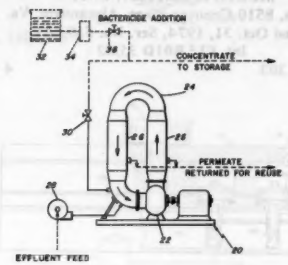
3,963,616
SEALING ARRANGEMENT FOR HYPERFILTRATION

Gary L. Parsons, Gastonia, and James Keith Turner, Lincolnton, both of N.C., assignors to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Filed July 26, 1974, Ser. No. 492,267
Int. Cl.² B01D 31/00
U.S. Cl. 210—232 4 Claims

1. A hyperfiltration module having a bundle of elongate, porous tubes lined with semipermeable membranes and fixed in sealed relation within a chamber so that liquid to be filtered

is directed in parallel therethrough, and wherein an improved arrangement is provided for effecting said sealed relation of said tube ends within said chamber comprising flat closure members fixed adjacent each end of said chamber and having a pattern of apertures formed therein for respective slip fit disposition of end portions of each tube of said bundle therethrough, a resilient O-ring sealing member disposed around each tube end portion at the outer face of each of said closure members, and a face flange at each closure member having a



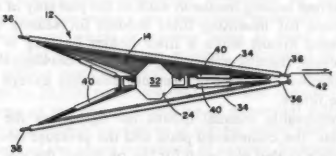
corresponding pattern of apertures formed therein for receiving said tube end portions, said face flanges being bolted at the outer face of each closure member over said O-ring members with spacer elements interposed between said face flanges and closure members at a thickness proportioned to limit compression of said O-ring members by said bolted face flanges against destructive stressing of said tube end portions while allowing enough compression of said O-ring members for effective external sealing of said tube end portions at said closure members.

3,963,617

RETRIEVAL MEANS FOR A FLOATING LIQUID SPILLING

William P. Kirk, 22 Glenhaven Circle, Saco, Maine 04072, and Dwight W. Reynolds, R.F.D. 1, Box 49, Pownal, Maine 04069

Filed Jan. 22, 1975, Ser. No. 543,169
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 S **12 Claims**



1. Retrieval means for a floating liquid spilling comprising the combination of

a flexible sheet having edges forming a polygonal periphery and flotation means attached to a portion of the sheet inwardly of said periphery,

first and second weight means each extending along an edge of the sheet with the flotation means therebetween, each said weight means being elongate, relatively inflexible and attached along its length to one said edge, and

third and fourth weight means each comprising a first elongate portion having one end hinged to the first weight means and a second elongate portion having one end hinged to the second weight means, the other ends of the first and second portions being mutually hinged, each of said first and second portions being attached along its length to the sheet, said third and fourth weight means extending between the first and second weight means with the flotation means therebetween and being adapted, upon the sheet falling freely on to the spilling while spread out generally parallel to the spilling surface, to permit the first and second portions to fold together in response to the sinking of the first and second weight means and movement thereof together, thereby confining and concentrating a quantity of the spilling at the region of the flotation means.

3,963,618

NOVEL POLYMER MEMBRANES FOR REVERSE OSMOSIS

William McClements Muir, Gartmore, England, assignor to Babcock & Wilcox Limited, London, England

Filed July 25, 1974, Ser. No. 491,852
Int. Cl.² B01D *39/00, 39/14*
U.S. Cl. 210—500 M **7 Claims**

1. A semi-permeable membrane for use in the treatment of feed solutions by reverse osmosis, ultrafiltration or related techniques consisting essentially of a polyvinyl coacetal resin having a backbone chain of the general formula

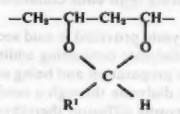
$$-X^1-X^2-X^3-X^4-X^5\ldots.X^n-$$

wherein each X of X^1, X^2 . . . X^n is selected from the group consisting of

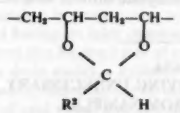
hydroxy-bis-methylene $—CH_2—CH(OH)—$,

acetoxy-bis-methylene $—CH_2—CH(OCO.CH_3)—$,

a first acetal group



and a second acetal group



provided that said first and second acetal groups are both present and together comprise 25 to 100% of the chain, said groups R^1 and R^2 being different and each being selected from the group consisting of a hydrogen atom, straight or branched alkyl or alkenyl groups containing up to 6 carbon atoms and phenylalkyl or phenylalkenyl groups wherein the alkyl or alkenyl group is straight or branched and contains up to 6 carbon atoms.

3,963,619

APPARATUS FOR THE PREVENTION OF SCALING IN DESALINATION APPARATUS

Andre Caillaud, Garches; Pierre Charult, Montpellier; Claude Duffau, Toulon, and Jean Ravoire, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique and Compagnie des Salins du Midi et des Salines de l'Est, both of Paris, France

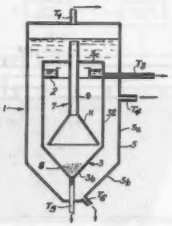
Filed Feb. 28, 1974, Ser. No. 501,299
Claims priority, application France, Sept. 7, 1973, 73.32373
Int. Cl.² B01D *21/02*
U.S. Cl. 210—256 **4 Claims**

1. An apparatus for the separation of solids from a liquid suspension to produce a solids stream and a stream of clarified liquid, said apparatus comprising:

a closed inner vessel mounted within an outer vessel and spaced therefrom to define a continuous liquid space, said liquid space enabling the inner vessel to be totally covered and surrounded by a continuous body of the liquid dispersion;

an inverted funnel member comprising a lower cone portion disposed within and opening into said inner vessel and an upper duct portion extending into and opening into said outer vessel at an inlet point within the liquid space covering said inner vessel, thereby providing fluid communication between said inner and outer vessels;

means for introducing the liquid suspension into said outer vessel;



first solids discharge means for removing solids which collect at the bottom of said outer vessel, said inner vessel being interposed between said first discharge means and said inlet point;

second solids discharge means for removing solids which collect at the bottom of said inner vessel; and

liquid discharge means for removing the clarified liquid from the upper interior of said inner vessel, said liquid discharge means comprising a gutter member mounted within said upper interior of said inner vessel and duct means, in communication with said gutter means for removing liquid from said gutter member;

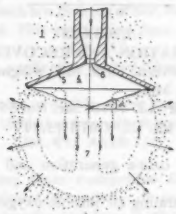
said second solids discharge means and said duct means extending through the walls of said outer vessel.

3,963,620

PURIFICATION FILTER FOR LIQUIDS

Zdenek Vor, Akersberga, Sweden, assignor to Allmanna Ingenjorsbyran AB, Stockholm, Sweden

Filed July 26, 1974, Ser. No. 492,165
Int. Cl.[2] B01D *23/16, 23/20*
U.S. Cl. 210—279 **5 Claims**



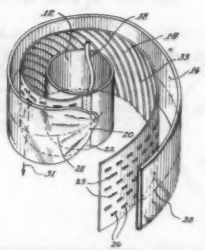
1. An upstream filtering means for liquids having a bed of granular material therein, the grains of which are of approximately uniform mean grain size, and having means embedded in the granular bed for fluidizing the whole bed during a rinsing step comprising a housing, a filter bed of such granular material located within the housing, at least one liquid distributor means that forms a part of said means for fluidizing embedded within the granular material, said distributor means having an enlarged body closed at the top for supporting some of the granular material in the housing above the body and open at the bottom for defining a cavity within said filter bed, said enlarged body being constructed and arranged to cause the granular material to repose under the enlarged body of said distributor means in a manner to generally define the lower wall of said cavity, said lower wall of the cavity being shaped to increase the size of said cavity beyond said space enclosed by said body, said distributor means supporting a downwardly directed nozzle in said cavity, the diameter of said nozzle being larger than the mean grain size of the granular material, a fluid conduit connected to the top of said body and communicating with said cavity through said nozzle, said nozzle having an outlet opening to produce a jet stream of fluid that has a small cross-sectional area as compared with the average cross-sectional area of said cavity, means to supply liquid to said filtering means through said conduit to produce said jet stream flow, said nozzle outlet being situated in said cavity above said lower wall and said jet stream being in a filtration step directed downwardly through said nozzle to flow through said cavity as a concentrated jet and reach the granular material at a local point to fludize only a portion of the bed under the enlarged body and in a rinsing step the stream flow of the liquid being substantially increased through said bed to fluidize the entire bed.

3,963,621

MEMBRANE DIFFUSION DEVICE HAVING RIBBED MEMBRANE SUPPORT

Ferris E. Newman, Libertyville, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 21, 1974, Ser. No. 516,527
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 B **10 Claims**



1. In a membrane diffusion device which comprises a flat, tubular, semi-permeable membrane and a flexible, ribbed, membrane support sheet positioned against said tubular membrane, said tubular membrane and support sheet being coiled together into a spiral with coils of membrane being positioned between coils of said support sheet, the improvement comprising:

a first set of membrane-supporting rib sections arrayed in a series of lines on one side of said support sheet, said linear array of rib sections of the first set being disposed in longitudinal relation to the axis of said tubular membrane, said rib sections of the first set being spaced from each other to define a plurality of spaces between the rib sections to permit fluid flow transversely across said membrane between said rib sections in linear array; and

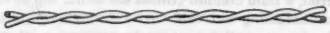
a second set of membrane-supporting ribs on the other side of said membrane support sheet, said ribs of the second set defining an angle with said tubular membrane axis.

3,963,622

FLUID TREATMENT APPARATUS

Jacques Baudet, Roussillon; Michel Salmon, Mions, and Andre Sausse, Sceaux, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 31, 1974, Ser. No. 475,277
Claims priority, application France, June 1, 1973, 73.20040; Apr. 2, 1974, 74.11674
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 R 16 Claims



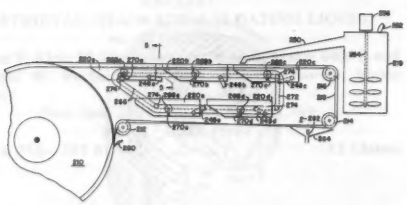
9. Fluid fractionating apparatus comprising:
a. at least one cord consisting of at least two hollow fibres of macromolecular material twisted together wherein the degree of twisting of each individual fibre on itself is less than one sixth of a revolution per turn of twist of fibre to form a cord;
b. a jacket enclosing said at least one cord;
c. means separating the interiors of the various hollow fibres from the exteriors of the hollow fibres within the jacket;
d. at least one passage connecting the interior of the jacket outside the hollow fibres to the exterior; and
e. at least one passage connecting the interior of the hollow fibres to the exterior of the jacket.

3,963,623

ROTARY VACUUM DRUM FILTER

Stephen Alan Buss, and Benjamin Alvin Buss, both of 1315 - 23rd Ave. Court, East Moline, Ill. 61244

Filed Jan. 6, 1975, Ser. No. 538,605
Int. Cl.² B01D *33/14*
U.S. Cl. 210—401 13 Claims



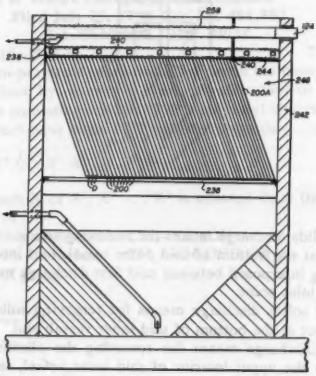
1. A rotary drum filter arrangement comprising:
a. a vacuum drum mounted for rotation about a substantially horizontal axis;
b. a rotatable member spaced from the vacuum drum and mounted for rotation about an axis parallel to the axis of the filter drum with the upper portion of its periphery in substantially horizontal alignment with the upper portion of the periphery of the vacuum drum;
c. a roller mounted for movement about an axis parallel to the axis of the vacuum drum in a position generally between the vacuum drum and rotatable member, closely adjacent to the vacuum drum and above a horizontal plane passing through the axis of rotation of the vacuum drum;
d. an endless flexible filter belt trained about the vacuum drum and rotatable member to form upper and lower reaches with the lower reach thereof passing between the vacuum drum and roller and over the roller whereby the filter belt is in engagement with at least 270 degrees of the periphery of the vacuum drum;
e. means for rotating the vacuum drum in a direction to move the upper reach of the filter belt toward the vacuum drum;
f. means for applying a slurry to the filter belt remote from the drum; and
g. means including a vacuum means for forming a cake on the filter belt from the slurry applied thereto prior to the belt moving the slurry to the vacuum drum.

3,963,624

CLARIFIER

Angus D. Henderson, Bayside, N.Y.; Francis H. Verhoff, South Bend, Ind., and John M. Periale, Central Islip, N.Y., assignors to Telecommunications Industries, Inc., Copiague, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,013
Int. Cl.² B01D *21/02*
U.S. Cl. 210—521 17 Claims



1. A clarifier, comprising:
a tank having an inlet and an outlet for a liquid having entrained solids;
a lamina including a plurality of spaced apart substantially parallel plates disposed at an angle to the horizontal and vertical, said lamina being disposed between said inlet and outlet so that said liquid passes between said plates as it progesses from said inlet to said outlet, and throttling means at the outlet ends of said plates for equalizing flow within said plates, said throttling means comprising a screen disposed on the outlet edges of said plates.

3,963,625

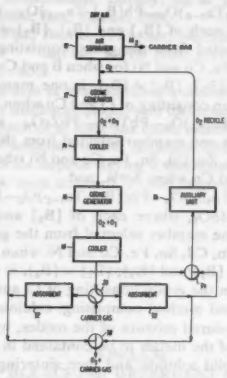
OZONE GENERATION AND RECOVERY SYSTEM

Frank E. Lowther, Severna Park, Md., assignor to W. R. Grace & Co., Columbia, Md.

Filed Mar. 12, 1975, Ser. No. 557,595
Int. Cl.² C01B *13/11*
U.S. Cl. 250—533 7 Claims

1. A continuous ozone generation and recovery system which comprises:
a. means for separating air into an oxygen-rich gas stream and a nitrogen-rich gas stream;
b. at least one corona discharge ozone generator;
c. means for passing the oxygen-rich gas streams through said ozone generator to synthesize ozone in low concentration;
d. means for cooling the ozone containing oxygen-rich gas stream from means (c);
e. means for contacting the cooled gas stream from means (d) with a solid ozone adsorbent to adsorb ozone therefrom;

f. means for recycling the oxygen-rich gas stream from means (e) to the ozone generator; and



g. means for desorbing the adsorbed ozone from the adsorbent using said nitrogen-rich gas stream from means (a).

3,963,626

FIRE EXTINGUISHANT FOR FISSIONABLE MATERIAL

Charles R. Schmitt, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation-in-part of Ser. No. 356,865, May 3, 1973, Pat. No. 3,938,012. This application Mar. 22, 1974, Ser. No. 454,027

Int. Cl.² A62D *1/00*

U.S. Cl. 252—2 **9 Claims**

1. A method for extinguishing a radioactive or fissionable metal fire comprising the step of placing carbon microspheroids on said fire, said microspheroids having as an impregnant a neutron absorber selected from the group consisting of boron, cadmium, and gadolinium.

3,963,627

SURFACE TREATMENT OF PARTICULATE SOLIDS

Arnold George Cottrell, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 263,213, June 15, 1972, Pat. No. 3,830,738, which is a division of Ser. No. 109,568, Jan. 25, 1971, abandoned. This application June 11, 1974, Ser. No. 478,333

Claims priority, application United Kingdom, Feb. 16, 1970, 7385/70

The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.² A62D *1/12*

U.S. Cl. 252—4 **2 Claims**

1. A fire-fighting foam compatible fire-fighting powder composition consisting essentially of an acidic or neutral fire-extinguishing powder and from 0.1% to 5% of a partially-hydrophobic powdered silica having a surface area of at least 10 square meters per gram and carrying a surface treatment with a silane of the formula $(R)_n - Si - (L)_{4-n}$ where n has the value of 1, 2 or 3 and R is a hydrophobic group which is non-reactive to the silanol groups on the silica surface and is a hydrocarbon group or a substituted hydrocarbon group, the hydrocarbon group being selected from alkyl and alkenyl of up to 20 carbon atoms, phenyl, benzyl, tolyl, cyclopentyl and cyclohexyl, the substituent being selected from chlorine, fluorine, trifluoromethyl, or alkyl ether and L is a group which is reactive to the silanol groups on the silica surface and is a chlorine or an alkoxy group containing up to 5 carbon atoms, and possessing a degree of hydrophobicity measured by the methanol titration test in the range 5 to 35.

3,963,628

FIBER LUBRICANT COMPOSITION

Kisoon Park, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 7, 1974, Ser. No. 477,416

Int. Cl.² D06M *13/18*

U.S. Cl. 252—8.8 **10 Claims**

1. An emulsifiable textile lubricant composition comprising:

A. from 40 to 80 weight percent of mineral oil having a viscosity of from 60 to 140 SUS at 100°F.,

B. from 10 to 50 weight percent of a copoly(oxyethylene-oxypropylene) monoether of the formula:

$$RO(CH_2CH_2O)_x(\overset{CH_3}{\overset{|}{C}}HCH_2O)_yH$$

wherein R is alkyl of 8 to 18 carbon atoms, the sum of x plus y is from 5 to 9 with x constituting from 25 to 75 weight percent of said sum of x plus y,

C. from 1 to 20 weight percent of an organic phosphate of the formula:

$$\left[R'O(CH_2CH_2O)_n\right]_m P(OH)_{3-m}$$

wherein R′ is alkyl of from 8 to 18 carbon atoms, or alkaryl or aralkyl of from 12 to 18 carbon atoms in which the alkyl group contains from 6 to 12 carbon atoms, n has a value of 3 to 25 and m has a value of 1 to 3, and

D. from zero to 10 weight percent of an alkanolamine having a molecular weight of 120 to 240.

3,963,629

FABRIC SOFTENER COMPOSITION FOR USE IN A CLOTHES DRYER AND METHOD

James Hugh McLaughlin, Chatham, Mass., assignor to Center for New Product Development, New York, N.Y.

Division of Ser. No. 164,835, July 21, 1971, Pat. No. 3,806,359. This application Dec. 6, 1973, Ser. No. 422,193

Int. Cl.² D06M *13/46*

U.S. Cl. 252—8.8 **5 Claims**

1. A pressurized, self-propellant composition suitable to be dispensed from an aerosol container for use in a clothes dryer comprising, by weight of the total composition (a) from about 1.0 to 30.0 percent of a fabric softener, (b) from about 50.0 to 94.0 percent of a solubilizer, and (c) from about 5.0 to 25.0 percent of a propellant, and wherein the solubilizer includes water in an amount comprising at least 40.0 percent of the total composition, said (a), (b) and (c) providing a stable, substantially form-sustaining, substantially non-penetrating, surface adherent, easily distributable foam when dispensed from said aerosol container.

3,963,630

LEAD ZIRCONATE-TITANATE POWDER OF PARTICLE SIZES BETWEEN 0.02 AND 0.2 MICRON, PROCESS FOR PRODUCING SAME, AND HIGH-DENSITY PIEZOELECTRIC CERAMICS MADE OF POWDER

Masatomo Yonezawa; Tomeji Ohno, both of Tokyo; Keizo Iwase, Shiga; Toshio Takada, Kyoto; Masao Kiyama, Kyoto, and Toshikazu Akita, Kyoto, all of Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Feb. 7, 1975, Ser. No. 547,806

Claims priority, application Japan, Nov. 21, 1974, 49-134663

Int. Cl.² C04B *35/46, 35/48*

U.S. Cl. 252—62.9 **4 Claims**

1. A process for producing crystalline powder of a composition given by the chemical formula: $Pb\,Ti_q\,Zr_p\,O_3$, where y and z represent mol ratios, the sum of q and p being equal to 1.00, the mol ratio q being not smaller than 0.45 and not greater than 0.90, the mol ratio p being not smaller than 0.10 and not greater than 0.55, comprising the steps of:

preparing an acidic aqueous solution of the metallic elements in the mol ratios given in said formula,

neutralizing said aqueous solution to provide a suspension of hydroxides of the metallic elements,

subjecting said suspension in an autoclave under pressure to a temperature between 150° and 300°C for a time sufficient to produce crystalline precipitate of said composition and of an average particle size between 0.02 and 0.2 micron in a mother liquor, and

separating said precipitate from said mother liquor.

2. A process for preparing a composition represented by the chemical formula: $Pb(Mn_{1/3}.Sb_{2/3})_x.Ti_y.Zr_z.O_3$, where x, y and z represent mol ratios, the sum of x, y and z being equal to 1.00, and x, y, and z fall on the boundary of and within a heptagon ABCDEFG in a triangular compositional diagram of a ternary-system solid solution shown in FIG. 1, the vertices A, B, C, D, E, F, and G of said heptagon being given by:

	x	y	z
A	0.10	0.80	0.10
B	0.01	0.71	0.28
C	0.01	0.09	0.90
D	0.05	0.05	0.90
E	0.30	0.05	0.65
F	0.30	0.50	0.20
G	0.20	0.70	0.10,

said process comprising the steps of:

preparing an aqueous solution of the metallic elements in the mol ratios given in said formula,

neutralizing said aqueous solution to provide a suspension of hydroxides of said metallic elements,

subjecting said suspension in an autoclave under pressure to a temperature between 150° and 300°C for a time sufficient to produce crystalline precipitate of said composition and of an average particle size between 0.02 and 0.2 micron in a mother liquor, and

separating said precipitate from said mother liquor.

3,963,631

METHOD OF PREPARING FERROELECTRIC CERAMICS

Hiromu Ouchi, Toyonaka; Masamitsu Nishida, Osaka, and Kazunori Numata, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 3, 1975, Ser. No. 546,780

Claims priority, application Japan, Feb. 20, 1974, 49-20823

The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.

Int. Cl.² C04B *35/46, 35/48*

U.S. Cl. 252—62.9 **6 Claims**

1. A method of preparing a ferroelectric ceramic selected from the group consisting of:

I. $Pb([B_1]_A Ta_{1-A})O_3—PbTiO_3—PbZrO_3$, where $[B_1]$ is one member selected from the group consisting of Mg, Zn, Cd, Sn, Mn, Fe, Co and Ni when A=⅛, and $[B_1]$ is one member selected from the group consisting of Li and Cu when A=¼,

II. $Pb([B_2]_B Ta_{1-B})O_3—Pb[B_3]_C Ta_{1-C})O_3—PbTiO_3—PbZrO_3$, where each of $[B_2]$ and $[B_3]$, $[B_2] \neq [B_3]$, is one member selected from the group consisting of Mg, Zn, Cd, Sn, Mn, Fe, Co and Ni for when B and C=⅛, and each of $[B_2]$ and $[B_3]$, $[B_2] \neq [B_3]$, is one member selected from the group consisting of Li and Cu when B and C=¼,

III. $Pb([B_1]_A Ta_{1-A})O_3—PbTiO_3—PbZrO_3$ with MnO_2, where $[B_1]$ is one member selected from the group consisting of Mg, Zn, Cd, Sn, Fe, Co and Ni when A=⅛, and $[B_1]$ is Li and Cu when A=¼, and

IV. $Pb([B_2]_B Ta_{1-B})O_3—Pb([B_3]_C Ta_{1-C})O_3—PbTiO_3—PbZrO_3$ with MnO_2, where each of $[B_2]$ and $[B_3]$, $[B_2] \neq [B_3]$, is one member selected from the group consisting of Mg, Zn, Cd, Sn, Fe, Co and Ni when B and C=⅛, and each of $[B_2]$ and $[B_3]$, $[B_2] \neq [B_3]$, is one member selected from the group consisting of Li and Cu when B and C=¼, said method comprising: calcining at 700° to 900°C a powdered mixture of the oxides, hydroxides, or carbonates of the metals to be contained in the ceramics to form a solid solution and then sintering at 1200° to 1300°C, then heat treating at a temperature lower by about 100° to 400°C than the sintering temperature, maintaining said heat treating for about 1 to 60 hours, and then cooling the material subjected to said heat treatment at a cooling rate of from about 300°C per hour to about 10°C per hour, so as to increase the tensile strength and decrease the resonant impedance of said ceramics.

3,963,632

INSULATING COMPOSITIONS

Koji Tanaka, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 198,764, Nov. 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 885,175, Dec. 15, 1969, abandoned. This application Jan. 7, 1974, Ser. No. 431,308

Claims priority, application Japan, Dec. 17, 1968, 43-92585

Int. Cl.² H01B *3/02*

U.S. Cl. 252—63.2 **10 Claims**

1. An electrical insulating coating composition of improved surface insulating qualities in the presence of moisture and ionizible salts comprising an electrically insulating resinous matrix component having incorporated therein both a cationic ion-exchanger component and an anionic ion-exchange component wherein each of said anionic exchanger component and said cationic exchanger component is incorporated in said coating composition in the amount of from 5.0 to 35% based on the total weight of said coating composition.

7. A method of restoring the surface insulating qualities of contaminated electrical insulators which comprises applying to the exposed surfaces of said insulator a liquid film of the composition according to claim 1 via a solution or suspension of said coating composition in a solvent vehicle and then removing said vehicle and leaving a coating of said composition.

9. A method of providing electrical insulation to electrical conductors which comprises the steps of coating said conductors with the composition according to claim 1 in a solvent vehicle and removing said vehicle to provide the insulating conductor coated with the composition according to claim 1.

3,963,633

GAS DISCHARGE DEVICE DIELECTRIC CONTAINING SELENIUM, TELLURIUM AND/OR POLONIUM

Michael E. Fein; Bernard W. Byrum, Jr., both of Toledo, and Roger E. Ernsthausen, Luckey, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 6, 1971, Ser. No. 205,275
Int. Cl.[2] H01B 3/00, 3/10
U.S. Cl. 252—63.2 3 Claims

1. As an article of manufacture, a dielectric material body for a gaseous discharge panel, said dielectric body containing a surface deposit of at least one oxide selected from the group consisting of selenium oxide, tellurium oxide, and polonium oxide, said oxide deposit having a thickness of at least about 200 angstrom units to about 10,000 angstrom units.

3,963,634

POWDERY BLEACHING DETERGENT COMPOSITION

Kyozaburo Tachibana, Sakura, and Takashi Fujino, Yokohama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1974, Ser. No. 460,911
Claims priority, application Japan, Apr. 17, 1973, 48-43331
Int. Cl.[2] C11D 9/42
U.S. Cl. 252—96 2 Claims

1. In a powdery bleaching detergent composition consisting of a mixture of particles of sodium percarbonate and detergent component, said detergent component consisting of a surfactant selected from the group consisting of anionic surfactants, nonionic surfactants and mixtures thereof, neutral or alkaline inorganic builders and other conventional detergent additives, the improvement which comprises; at least 60 percent by weight of said detergent component has particle diameters larger than 250μ, the copper content of said detergent component being less than 2 ppm and the iron content of said detergent component being less than 5 ppm, and at least 60% by weight of said sodium percarbonate has particle diameters larger than 250μ.

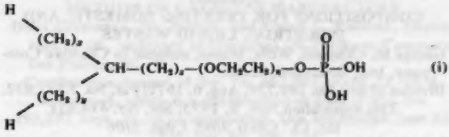
3,963,635

DISHWASHING COMPOSITIONS

Peter Leonard Dawson, Chester, and Michael Tom Rothwell, Bromborough, both of England, assignors to Lever Brothers Company, New York, N.Y.

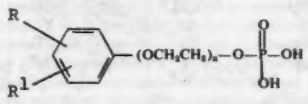
Filed Oct. 1, 1973, Ser. No. 402,420
Claims priority, application United Kingdom, Oct. 16, 1972, 47675/72
Int. Cl.[2] C11D 7/08; C23G 1/02
U.S. Cl. 252—142 6 Claims

1. In a liquid hand dishwashing composition of the type having a pH of not more than 7 and comprising from about 10 to about 50% by weight of a detergent active compound from 5 to 40% by weight of which is a calcium/magnesium sensitive anionic synthetic detergent selected from the group consisting essentially of C_{11-13} α and random alkene sulphonates, random C_{13-18} alkane sulphonates, C_{10}–C_{15} alkyl benzene sulphonates, C_{11}–C_{18} primary and secondary alcohol sulphates and mixtures thereof, and water the improvement which comprises in incorporating in the composition from 0.01 to 2% by weight of a phosphate monoester having the general formulae

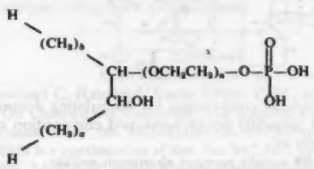


(i)

wherein $x + y + z$ is from 9–17 and one of x,y and z may be zero, and n is zero or 1,



wherein R and R^1 are C_8–C_{18} alkyl groups and one of R and R^1 may be hydrogen,



(iii)

where $a + b$ is from 10–16 and one of a and b may be zero and n is zero or 1,

and (iv) analogues of said esters having the formulae (i), (ii) and (iii), the alkyl groups being substituted by alkenyl groups, and from 1 to 40% by weight of a nonionic or anionic solubilizer, a 0.05% aqueous solution of which will remain clear at 24°H of hardness and neutral pH at temperatures of from 20°–45°C the ratio of the total amount of detergent active compound and solubilizer to the amount of phosphate monoester in the composition being from 1500:1 to 30:1 when the phosphate monoester is derived from a linear primary alcohol, from 1000:1 to 50:1 when the phosphate monoester is derived from a branched chain primary alcohol, and from 600:1 to 150:1 when the phosphate monoester is derived from a linear secondary alcohol.

3,963,636

TREATMENT OF WATER OR AQUEOUS SYSTEMS

Arthur Harris, Poynton; John Burrows, Congleton, and Thomas Ivor Jones, Poynton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

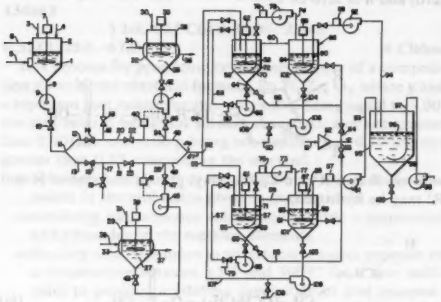
Division of Ser. No. 312,019, Dec. 4, 1972, Pat. No. 3,897,209.
This application May 8, 1975, Ser. No. 575,690
Int. Cl.[2] C02B 5/06; C23F 11/18, 11/12
U.S. Cl. 252—181 8 Claims

1. A composition for inhibiting the corrosion and scale forming tendencies of water or an aqueous system comprising from 2.5 to 80% by weight of zinc (calculated as Zn^{++}) and 97.5 to 20 percent by weight of hydrolyzed polymaleic anhydride, or of a water soluble salt of such a hydrolyzed polymaleic anhydride.

3,963,637
COMPOSITIONS FOR TREATING DOMESTIC AND INDUSTRIAL LIQUID WASTES

George M. Chappell, Wells, Maine, assignor to Chemlan Company, Inc., Biddeford, Maine

Division of Ser. No. 169,739, Aug. 6, 1971, Pat. No. 3,812,032. This application Nov. 5, 1973, Ser. No. 414,611
Int. Cl.[2] C02B 9/00; C02C 5/06
U.S. Cl. 252—181 8 Claims



1. An acid formula composition for flocculating domestic, municipal, and industrial liquid waste said composition consisting essentially of:

a. about 30–98 weight percent aluminum sulfate,
b. about 2–20 weight percent of an alkali metal chloride,
c. about 0.0005 – 0.1 weight percent of sodium or potassium hypochlorite,
d. about 10–25 weight percent of an inorganic acid selected from the group consisting of phosphoric, hydrochloric, sulfuric and nitric acids, and
e. about 1–25 weight percent of an organic acid selected from the group consisting of oxalic, formic, acetic and lactic acids.

3,963,638
LIQUID CRYSTAL COMPOSITIONS, METHODS AND DEVICES

Hermann K. Bucher, and Thomas R. Criswell, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,648
Int. Cl.[2] C09K 3/34; G02F 1/13
U.S. Cl. 252—299 11 Claims

1. A nematic liquid crystal composition which exhibits dynamic scattering upon subjecting a thin film of said composition to an electrical potential, said composition comprising:

at least one nematic liquid crystalline compound having a negative dielectric anisotropy and an amount of an organic salt effective to aid dynamic scattering, said salt being soluble in said composition and having the formula:

$$M^+RX^-$$

wherein M^+ is a cation aiding solubility of said salt in said composition, said cation having the structure $(R''')_4N^+$ in which (a) each R''' is an alkyl group with the total carbon atom content of all four R''' groups being at least 11 or (b) any three of R''' taken together represent the carbon atoms necessary to complete a 6- to 10-membered heterocyclic nucleus and the fourth R''' represents an alkyl group of about 8 to 24 carbon atoms; and RX^- represents an anion selected from the group consisting of p-chlorobenzenesulfonate, p-nitrobenzenesulfonate, 2,5-dichlorobenzenesulfonate, p-bromobenzenesulfonate, 2-chloro-5-methylbenzenesulfonate, 2-methyl-5-nitrobenzenesulfonate, 2-chloro-5-nitrobenzenesulfonate, 2-chloro-3,5-dinitrobenzenesulfonate, pentafluorobenzoate, and 2-naphthalenesulfonate.

3,963,639
FLUORESCENT LAMP AND METHOD FOR THE MANUFACTURE THEREOF

Richard M. Klein, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

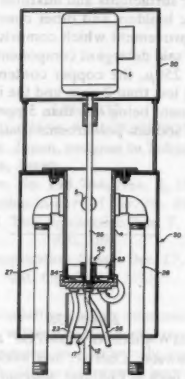
Division of Ser. No. 364,568, May 29, 1973, Pat. No. 3,890,522. This application Oct. 23, 1974, Ser. No. 513,804
Int. Cl.[2] C09K 11/08
U.S. Cl. 252—301.36 5 Claims

1. An aqueous suspension comprising water; finely-divided phosphor particles; a temporary organic binder which can be essentially completely removed from a lamp envelope, on which the suspension has been coated, upon firing under appropriate conditions; and a minor amount of an additive which will yield a phosphate glass coating on said phosphor particles when a lamp envelope, on which the suspension has been coated, is fired under appropriate conditions, said additive comprising a mixture of orthophosphoric acid and zinc nitrate.

3,963,640
PROCESS OF PREPARING SODIUM-ALUMINUM SILICATE DISPERSION COMPLEX AND COMPOSITION

Fred Smith, Norwich, England, assignor to Anglian Water Authority, Norwich, England

Continuation-in-part of Ser. No. 461,077, April 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 262,865, June 14, 1972, abandoned. This application Feb. 14, 1975, Ser. No. 549,273
Claims priority, application United Kingdom, June 24, 1971, 29737/71; Mar. 23, 1972, 13644/72
Int. Cl.[2] B01J 13/00
U.S. Cl. 252—313 R 9 Claims



1. A process in which a complex sodium aluminium silicate polymeric material that is completely soluble in hydrochloric acid and that is a stable dispersion in water is made by feeding an aqueous solution of sodium silicate and an aqueous solution of aluminium sulphate separately through separate inlets arranged around the base of a cylindrical chamber into the chamber, and rotating at a speed of about 1,000 to 5,000 r.p.m. rotor blades that are at least two-thirds the diameter of the chamber and that are mounted close to the base of the chamber not more than about 6 mm above the inlets, the proportions of sodium silicate and alumium sulphate and the total amount of water introduced into the chamber being such that in the product of the process the amount of silicate, measure as SiO_2, is 0.5 to 5% and the pH is from 3 to 7.5.

3,963,641

PROCESS FOR INTERRUPTING NORMAL OPERATION OF A HYDROCARBON GASIFICATION REACTOR

Günter Pockrandt, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 29, 1974, Ser. No. 518,836

Claims priority, application Germany, Dec. 6, 1973, 2360756

Int. Cl.² C01B 2/14

U.S. Cl. 252—373 7 Claims

1. In a process for operating a reactor for the gasification of hydrocarbons with oxygen and water vapor under a pressure of about 3–100 kilograms per square centimenter and at temperatures between about 1000°C and 1500°C to produce a product gas which contains mainly hydrogen and carbon monoxide, wherein the hydrocarbons are fed under pressure to a burner and are sprayed from the lance of said burner in atomized form into the reactor where said atomized hydrocarbons react with a mixture of oxygen and water vapor supplied to the reactor, the improvement for interrupting normal operation and holding the reactor at temperatures above 800°C during interrupted operation which comprises shutting off the supply of said mixture of oxygen and water vapor and feeding to said burner lance used in normal operation a mixture of hydrocarbons and water vapor, said water vapor being fed under a pressure of about 10–60 kilograms per square centimeter, feeding said hydrocarbons used during said interrupted operation at a rate which is less than 10% of the rate used for normal operation by means of a feed pump and a succeeding metering pump and adjusting the pressure of said water vapor to be mixed with said hydrocarbons so that the pressure loss in the burner lance is higher than the feed pressure of the hydrocarbons between the feed pump and the metering pump, spraying an atomized mixture of hydrocarbons and water vapor into said reactor and burning at least part of said hydrocarbons together with compressed air fed into the reactor.

3,963,642

PROCESS FOR PRODUCING A REDUCING GAS

Heinz Jockel, Kelin-Gerau, and Hans-Joachim Renner, Neider-Erlenbach, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 278,672, Aug. 7, 1972, abandoned. This application July 25, 1974, Ser. No. 491,896

Claims priority, application Germany, Aug. 20, 1974, 2141875

Int. Cl.² C01B 2/16

U.S. Cl. 252—373 3 Claims

1. In a process for producing a reducing gas containing carbon monoxide and hydrogen and low amounts of carbon dioxide and water vapor wherein natural gas is reacted with water vapor under super-atmospheric pressures of 5 to 15 kilograms per square centimeter, the improvement which comprises

a. first reacting a partial amount of the natural gas feedstock with at least part of the water vapor to be used at temperatures of 350°–500°C in a shaft reaction zone in the presence of a high-nickel catalyst containing 10–50% by weight nickel on a magnesium silicate support to form a gas containing hydrogen and methane;

b. mixing said gas containing hydrogen and methane with the remaining amount of natural gas feedstock and any remaining amount of water vapor to be used, the overall ratio of water vapor to natural gas for steps (a) and (b) being in the range of 1.5:1 to 1:1; and

c. reacting said mixture at temperatures of 975°–1000°C in a tubular reaction zone in the presence of an indirectly heated nickel-containing catalyst on an alumina support thereby producing said reducing gas.

3,963,643

METHOD OF CATALYST MANUFACTURE

Dalia Germanas, Des Plaines, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 462,891, April 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 293,237, Sept. 28, 1972, abandoned. This application June 30, 1975, Ser. No. 592,134

Int. Cl.² B01J 27/08, 27/10

U.S. Cl. 252—442 11 Claims

1. In a method of catalyst manufacture, the steps of compositing from about 0.1 to about 5 wt. % platinum group metal with alumina, reacting the resultant composite with a Friedel Crafts metal halide in an amount sufficient to introduce from about 2 to about 15 wt. % combined halogen into the composite, and thereafter contacting the composite at a temperature of from about 100° to about 600° C. in a non-reducing atmosphere with a polyhalo compound containing at least 2 chlorine atoms selected from the group consisting of methylene halide, haloform, methylhaloform, carbon tetrahalide, sulfur dihalide, sulfuryl halide, thionyl halide, and thiocarbonyl tetrahalide in sufficient amount to add at least 0.1 wt. % combined halogen to the composite.

3,963,644

CONVERSION CATALYSTS

Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 84,141, Oct. 26, 1970, Pat. No. 3,836,454, which is a continuation of Ser. No. 643,353, June 5, 1967, Pat. No. 3,547,807, which is a continuation-in-part of Ser. No. 343,932, Feb. 11, 1964, Pat. No. 3,324,047, which is a continuation-in-part of Ser. No. 150,129, Nov. 6, 1961, abandoned, which is a continuation-in-part of Ser. No. 72,325, Nov. 29, 1960, abandoned. This application Jan. 9, 1974, Ser. No. 433,739

Int. Cl.² B01J 29/06

U.S. Cl. 252—455 Z 7 Claims

1. A hydrocracking catalyst composition prepared by intimately admixing a Y zeolite component with an amorphous component selected from the class consisting of alumina, magnesia and hydrogen montmorillonite clays, and consolidating the resulting mixture into granular form, at least about 20% of the exchange capacity of the zeolite component appearing in the final composition being decationized and/or satisfied by hydrogen ions, the final composition also containing a minor proportion of at least one Group VI-B and/or Group VIII metal, metal oxide or metal sulfide hydrogenating promoter supported on said amorphous component, said amorphous component comprising at least about 10 weight-percent of the final composition.

3,963,645

SUPPORTED METAL OXIDES

Abraham P. Gelbein, Plainfield, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 803,074, Feb. 27, 1969, abandoned. This application May 26, 1971, Ser. No. 147,159

Int. Cl.² B01J 29/06, 23/14, 23/16

U.S. Cl. 252—455 R 20 Claims

1. A composition of matter comprising:

a metal oxide selected from the group consisting of vanadia, molybdena, and mixtures thereof, supported on a porous support selected from the group consisting of silica-alumina and gamma-alumina, said metal oxide being present in an amount to provide a metal oxide to support weight ratio ranging from about 0.3:1 to about 3:1 substantially entirely within the pores of the support, said metal oxide having been placed in molten form substantially within the pores of a support having a surface area greater than about 50 meter square per gram and a porosity greater than about 0.4cc per gram.

16. A process for producing a supported metal oxide comprising:

mixing at least one member selected from the group consisting of the oxides and salts of vanadium and molybdenum with a support having a surface area greater than about 50 meter square per gram and a porosity greater than about 0.4cc per gram, said support being selected from the group consisting of gamma-alumina and silica-alumina, said member having a fusion temperature no greater than about 1500°C and being mixed in an amount to provide from about 25% to about 75%, by weight, metal oxide in the final product, heating the mixture to a temperature above the fusion temperature of the salt whereby the member is drawn substantially, entirely into the pores of the support and further treating the supported member when the member is a metal salt to convert the salt to the metal oxide.

3,963,646
METHODS FOR THE MANUFACTURE OF COMPOSITE CATALYSTS CONTAINING A COMPOSITION OF A TRANSITION METAL ON A SUPPORT

Stanislas Teichner, and Gérard Gardes, both of Villeurbanne, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 2, 1973, Ser. No. 384,836

Claims priority, application France, Aug. 18, 1972, 72.29580

Int. Cl.² B01J *29/10, 29/20*

U.S. Cl. 252—459 **12 Claims**

1. A method for the preparation of a composite catalyst, starting from a solution in a non-aqueous solvent of a compound of at least one transition metal and of a salt of at least one metal able to provide a refractory oxide, each of said compounds being selected among those of said metals which are both hydrolysable by water to form the corresponding hydroxides and soluble in said non-aqueous solvent, which method comprises adding to said solution an amount of water sufficient to cause hydrolysis of said salts and treating the reaction medium with a non-aqueous and volatile solvent in an amount and under conditions of temperature and pressure that result in the critical point of said solvent being reached and even exceeded thereby causing all the solvent to be in the form of vapor and removing the solvent vapor from said reaction medium.

3,963,647
ELECTROSTATICALLY PAINTABLE INJECTION MOLDABLE BLEND OF PROPYLENE POLYMER, ETHYLENE/HIGHER α-OLEFIN COPOLYMER RUBBER AND CARBON BLACK

Robert Michael Straub, Wilmington, Del., assignor to E. I. Du Pont de Memours and Company, Wilmington, Del.

Filed Aug. 22, 1974, Ser. No. 499,555

Int. Cl.² C08K *3/04*; H01B *1/04*

U.S. Cl. 252—511 **11 Claims**

1. In an injection moldable, electrostatically paintable polyolefin composition comprising about 100 parts of an ethylene/higher α-olefin copolymer rubber, about 20–100 parts of crystalline propylene polymer, and carbon black, the improvement which comprises said carbon black having a mean particle diameter of from about 15–30 millimicrons and an oil absorption number (A) having a minimum value of about 40 cc/100 g. and a maximum value wherein A is calculated from the formula:

$A = 0.3116D^2 - 18.708D + 359.67$,

wherein D is the mean particle diameter, with the proviso that the maximum value of A is never greater than 130 cc/100 g., said carbon black is present within a range determined by the following formulas:

Minimum parts carbon black = $2.157D - 0.0145D^2$ 0.004-67AD −5.03;

Maximum parts carbon black = $0.863D - 0.0050D^2$ 0.006-25AD $-0.3663A + 0.00159A^2 + 49.19$;

wherein A and D have the values given hereinabove and parts of carbon black is based upon the total weight of polymers.

3,963,648
PERFUME CHEMICALS

Barry Nicholas Jones, Ingrove; Hifzur Rahman Ansari, London; Brian George Jaggers, Romford, and John Francis Janes, Epping, all of England, assignors to Bush Boake Allen Limited, Walthamstow, England

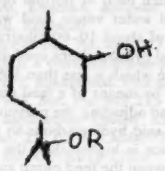
Continuation-in-part of Ser. No. 311,710, Dec. 7, 1972, abandoned. This application May 15, 1974, Ser. No. 470,282

Claims priority, application United Kingdom, Sept. 8, 1972, 41845/72

Int. Cl.² A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 **19 Claims**

1. A compounded perfumery composition comprising component A and component B, component A comprises a plurality of perfumery ingredients other than the perfumery ingredients defined as component B component B comprises at least one compound of the formula



where R is at least one group selected from methyl, ethyl, propyl, iso-propyl, n-butyl, sec-butyl, tert-butyl, pentyl or hexyl, component B being from 0.1 to 95% by weight based on the weight of said compounded perfumery composition.

3,963,649
LIQUID DETERGENT COMPOSITION

Gianfranco Luigi Spadini, Strombeek-Bever, and Bob Dekker, Beigem, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 5, 1973, Ser. No. 394,589

Claims priority, application Luxemburg, Sept. 11, 1972, 66053; Oct. 9, 1972, 66258

Int. Cl.² C11D *3/02, 3/16*

U.S. Cl. 252—546 **16 Claims**

1. A liquid dishwashing detergent composition comprising:

a. from about 2% to about 40% by weight of a water-soluble organic nonionic surface-active agent selected from the group consisting of:

1. tertiary oxides of the formula

$$R_1R_2R_3Y \rightarrow O \qquad (I)$$

wherein R_1 is a straight or branched, saturated or unsaturated, aliphatic hydrocarbon, hydroxyhydrocarbon, or alkyloxyhydrocarbon radical containing in total from 8 to 24 carbon atoms; and R_2 and R_3 are each a methyl, ethyl, hydroxymethyl, or hydroxyethyl radical; and Y is an N or P atom;

2. amides of the formula

$$R_4—CO—N(H)_{m-1}(R_5OH)_{2-m} \qquad (II)$$

wherein R_4 is a saturated or unsaturated, aliphatic hydrocarbon radical containing from 7 to 21 carbon atoms; R_5 represents a methylene or ethylene group; and m is 1, 2, or 3;

.. a condensation product of from about 3 to about 25 moles of ethylene oxide and one mole of an organic,

hydrophobic compound containing from about 8 to about 24 carbon atoms selected from the group consisting of C_{10}–C_{18} aliphatic alcohols, mono- and poly-C_5–C_{16} alkyl phenols, fatty acid esters of sorbitol, manitol and hexitol, C_{10}–C_{28} aliphatic and C_5–C_{18} alkyl aromatic carboxylic acids, C_7–C_{17} mono- and dialkanolamides and C_5–C_{18} alkyl- and alkenyl- and C_5–C_{18} alkaryl amines;

and mixtures thereof;

b. from about 0.1% to about 5% by weight of a water-soluble gelatin, having a molecular weight of at least 15,000, an iso-electric point between about pH 4.5 and about pH 9.2; and a gel strength between 50 and 300 Bloom grams;

c. from about 5% to about 95% by weight of water.

3,963,650

PROCESS FOR MAKING IMPROVED UREA/FORMALDEHYDE FOAMS

Dennis Henry Ogden, Penn, England, assignor to British Industrial Plastics Limited, Manchester, England

Continuation-in-part of Ser. No. 280,164, Aug. 14, 1972, abandoned, which is a continuation of Ser. No. 52,789, July 7, 1970, abandoned. This application Sept. 4, 1974, Ser. No. 503,530

Claims priority, application United Kingdom, July 16, 1969, 36069/69

Int. Cl.² C08J 9/00

U.S. Cl. 260—2.5 F **14 Claims**

1. A method of producing a low-density, self-sustaining urea/formaldehyde foam comprising foaming a mixture including an aqueous solution of thermosetting material comprising a urea/formaldehyde resin having a theoretical solids content of at least 40% and less than about 60% and a foaming agent to produce a first foam; foaming a mixture including an aqueous solution of a hardener for the resin and a foaming agent to form a second foam; and mixing the first foam with the second foam so that the liquid feed ratio of resin to hardener is from about 4:1 up to at most about 50:1.

3,963,651

METHOD OF CROSS LINKING AND HARDENING OF GRAPHITIC FORMED BODIES

Hubertus Nickel, Julich; Hartmut Luhleich, Duren, and Francesco Dias, Julich, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 9, 1974, Ser. No. 531,036

Int. Cl.² C08J 9/00

U.S. Cl. 260—2.5 F **2 Claims**

1. A method of cross-linking and hardening with the aid of heat to effect quick stabilizing of outside surface of a formed porous body of synthetic graphitic material that is bonded by means of a synthetic resin binding agent on a novolak basis, which includes in combination the steps of exclusively gassing the formed body at a temperature of from 100°C to 200°C with a quantity of formaldehyde which depends on a predetermined extent of cross-linking of said formed body, while causing said formaldehyde to advance from the outside surface of said formed body into the interior thereof.

3,963,652

ADHESION OF RUBBER TO REINFORCING MATERIALS

Syozo Tanimura, Minoo; Yutaka Terada, Nishinomiya, and Hiroshi Fukuhara, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Mar. 27, 1974, Ser. No. 455,126

Claims priority, application Japan, Mar. 27, 1973, 48-35455

Int. Cl.² C09J 3/14, 3/16; C09L 9/00, 61/12

U.S. Cl. 260—3 **6 Claims**

1. A vulcanizable rubber composition containing a rubber component, a formaldehyde-donor selected from the group consisting of di- to hexa-methylolmelamines, completely or partially etherified or esterified derivatives thereof and hexamethylenetetramine and a formaldehyde-acceptor, wherein the formaldehyde-acceptor is a co-condensate of formaldehyde with a mixture of resorcinol and a phenol selected from the group consisting of m-cresol, p-cresol, tertbutylphenols and tert-octylphenols, the molar ratio of formaldehyde and the mixture of resorcinol and the phenol being 0.4–1.3 : 1, and the weight ratio of resorcinol and the phenol being from 95:5 to 50:50, or a mixture of a condensate of resorcinol with formaldehyde and a condensate of the phenol with formaldehyde, the molar ratio of resorcinol and formaldehyde in the condensate of resorcinol with formaldehyde being 0.4–1.0 : 1, and the molar ratio of formaldehyde and the phenol in the condensate of the phenol with formaldehyde being 0.5–1.4 : 1, and the weight ratio of the condensate of resorcinol with formaldehyde and the condensate of the phenol with formaldehyde being from 95:5 to 50:50

3,963,653

PROCESS FOR PRODUCING HYDROCARBON RESIN AND PRESSURE-SENSITIVE ADHESIVES CONTAINING SAME

Shigeru Katayama; Izuru Yokoyama, and Katsuhiko Tasaka, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 452,577, March 19, 1974. This application June 17, 1975, Ser. No. 587,563

Claims priority, application Japan, Mar. 19, 1973, 48-30853

Int. Cl.² C08L 7/00, 53/02, 47/00, 9/00

U.S. Cl. 260—4 AR **6 Claims**

1. A pressure-sensitive adhesive composition mainly comprising the hydrocarbon resin (C) produced by the process which comprises copolymerizing 100 parts by weight of vinyl aromatic hydrocarbons (A) comprising about 80 to 100% by weight isopropenyltoluene and 0 to 20% by weight vinyl aromatic hydrocarbons having 8 to 9 carbon atoms and from about 5 to 100 parts by weight of a fraction (B) having a boiling point range from about −15°C to 45°C and comprising a major proportion by weight of unsaturated hydrocarbons having 4 to 5 carbon atoms, which is the by-product in the refining or cracking of petroleum, in the presence of a Friedel-Crafts catalyst and a rubber (D).

3. The pressure-sensitive adhesive composition as claimed in claim 1, wherein said rubber (D) is selected from the group consisting of natural rubber, a styrene-butadiene copolymer rubber, polybutadiene, polyisoprene, polyisobutylene, a butyl rubber, polychloroprene, a butadiene-acrylonitrile copolymer rubber and a polyvinyl ether.

3,963,654

IMPRESSION MATERIAL FOR USE IN AN IMPRESSION PACKER

Stanley O. Hutchison, Bakersfield; Glenn W. Anderson, Oildale, and Gordon L. Newby, Bakersfield, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 373,341, June 25, 1973, Pat. No. 3,855,854. This application July 29, 1974, Ser. No. 492,377

Int. Cl.² E21B 47/00; C08L 7/00

U.S. Cl. 260—5 **12 Claims**

1. An impression material for use in an impression packer comprising a smooth rolled sheet containing about 60 to 80% by weight partially cured synthetic nitrile rubber including cure chemicals, said nitrile rubber being a butadiene crylonitrile co-polymer and said cure chemicals comprising sulfur, stearic acid and zinc oxide present in an amount from about one-third to three-fourths the amount of said chemicals required for full cure, about 10 to 20% by weight natural rubber smoked sheet, about 5 to 15% by weight hydrated amorphous silica, and about 2 to 6% by weight of rubber processing oil.

3,963,655
AMYLOSE PECTIN ADHESIVE COMPOSITION FOR ADHESIVE TAPES

Robert W. Monte, Merrimack, N.H., assignor to Nashua Corporation, Nashua, N.H.

Division of Ser. No. 484,596, July 1, 1974. This application July 24, 1975, Ser. No. 598,830

Int. Cl.² C08L 3/12

U.S. Cl. 260—17.4 ST **4 Claims**

1. An adhesive composition suitable for application to a paper backing to form an adhesive tape which comprises an aqueous mixture of:

amylose pectin medium molecular weight starch	2.0 to 10.0 wt.%
urea	1.5 to 6.0 wt.%
sugar or sugar alcohol	5.0 to 10.0 wt.%
neutralized polyacrylate to molecular weight	1.0 to 6.0 wt.%

wherein the weight percents are based upon the weight of amylose pectin.

3,963,656
THERMOPLASTIC POLYURETHANES AND A TWO-STAGE PROCESS FOR THEIR PREPARATION

Ernst Meisert, Leverkusen, and Wilhelm Goyert, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 400,782, Sept. 26, 1973, Pat. No. 3,875,118. This application Jan. 31, 1975, Ser. No. 546,062

Claims priority, application Germany, Oct. 3, 1972, 2248382

Int. Cl.² C08G 18/32

U.S. Cl. 260—18 TN **2 Claims**

1. A multi-stage process for the production of polyurethane elastomers that can be worked up thermoplastically and processed as a millable gum comprising the steps of:

a. reacting in a first reaction stage a polyol having a molecular weight of between 700 and 1750 with 0.2 to 0.7 equivalents, per equivalent of polyol, of an aliphatic, cycloaliphatic or aromatic polyisocyanate to produce a diolurethane having a molecular weight of between 900 and 5300,

b. reacting in a second reaction stage the diolurethane of step (a) with 4,4′-diisocyanatodiphenylmethane and a diol having a molecular weight below 500 at an equivalent ratio of from 0.87 to 0.97 of 4,4′-diisocyanatodiphenylmethane to the total equivalents of diol-urethane and diol, and

c. mechanically mixing about 0.2 to 2.0 weight % of lubricant and mold release waxes selected from the group consisting of fatty acid esters, fatty acid amides, oxidized polyethylenes, microcrystalline waxes and silicone oil with the elastomer or any of its precursor reactants.

3,963,657
CURABLE WATER-BASE COMPOSITIONS

Eugene Richard Farone, Mentor, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

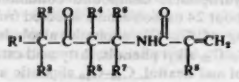
Continuation-in-part of Ser. No. 235,086, March 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 210,130, Dec. 20, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,681

Int. Cl.² C08L 61/20

U.S. Cl. 260—29.4 UA **22 Claims**

1. A curable composition comprising (A) at least one thermosetting acrylic polymer or aminoplast composition and (B) a water-soluble composition of matter consisting essentially of:

1. compounds of the formula



wherein each of R^1, R^2, R^3, R^4 and R^5 is hydrogen, a hydrocarbon radical, a substituted hydrocarbon radical wherein the substituents are halide, ether, keto, carboxy, ester, amide, nitro, cyano, thioether, sulfoxy or sulfone groups, a hydroxyalkyl radical having not more than 4 carbon atoms, or an alkoxy derivative of said hydroxyalkyl radical, at least one of R^1, R^2, R^3, R^4 and R^5 being a hydroxyalkyl radical of alkoxy derivative thereof; each of R^6 and R^7 is hydrogen, a hydrocarbon radical or a substituted hydrocarbon radical wherein the substituents are selected from those listed hereinabove; and R^8 is hydrogen, halogen, a lower alkyl radical or a substituted lower alkyl radical wherein the substituents are selected from those listed hereinabove; and

2. condensation dimers and trimers of said compounds.

3,963,658
LUBRICANT FOR POLYVINYL CHLORIDE MATERIALS

Walter Brotz, Gersthofen; Günther Illmann, Stadtbergen; Alfred Riedel, Gersthofen, and Friedrich Zinnert, Aystetten, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 18, 1975, Ser. No. 559,519

Claims priority, application Germany, Mar. 22, 1974, 2413827

Int. Cl.² C08L 91/00

U.S. Cl. 260—28.5 D **1 Claim**

1. Transparent composition of matter comprising

a. polyvinyl chloride and

b. 0.2 to 3.0 % by weight, calculated on the weight of component a), of a modified candelilla wax as lubricant obtained by saponifying candelilla wax by treating it with calcium, barium, magnesium, zinc or aluminium hydroxide to such a degree that a product is obtained having substantially no acid number and having a saponification number 5 to 20 units below that of the starting wax.

3,963,659
PRODUCTION OF BITUMEN COMPOSITIONS CONTAINING ETHYLENE-α-OLEFIN RUBBER

Gerhard Binder; Harald Blumel, and Helmut Krol, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Continuation of Ser. Nos. 421,961, Dec. 5, 1973, abandoned, Ser. No. 291,162, Aug. 22, 1972, abandoned, and Ser. No. 61,663, Aug. 6, 1970, abandoned. This application Apr. 25, 1975, Ser. No. 571,725

Claims priority, application Germany, Aug. 6, 1969, 1939926

Int. Cl.² C08L 95/00

U.S. Cl. 260—28.5 AS **3 Claims**

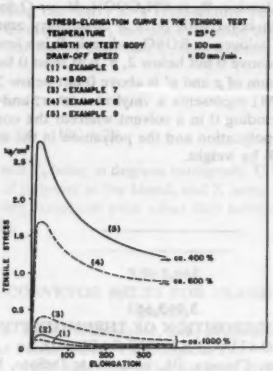
1. A process for the production of a homogeneous thermoplastic composition consisting essentially of on a 100 parts by weight basis about 75–99.5 parts bitumen and about 0.5–25 parts of an ethylene-α-olefin rubber having a Mooney viscosity (ML-4) of 35–90 and comprising on a mol basis 45–75% ethylene and 25–55% of propylene and having cross linkable double bonds said process comprising the steps of:

premasticating the ethylene-α-olefin rubber and during said premasticating adding a small amount of bitumen to obtain preliminary homogenization;

adding a small amount of bitumen to the premasticated rubber and masticating the resultant mixture to disperse the bitumen as a dispersed phase into the rubber as a continuous phase and continuing the mastication to form a homogeneous mixture;

and adding additional bitumen either in incremental batches, or gradually in a continuous manner and at a rate

such that each charge of bitumen is first homogeneously mixed before adding additional bitumen, and changing the type of added bitumen from a less viscous type to a



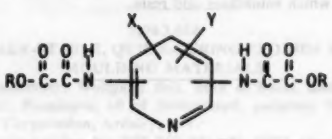
more viscous type during the step of adding same, and continuing the mastication to produce the homogeneous thermoplastic composition.

3,963,660
PYRIDINE DIOXAMIC ACIDS AND ESTERS

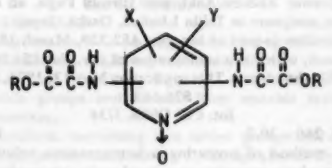
Charles M. Hall, and Herbert G. Johnson, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 403,677, Oct. 4, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,919
Int. Cl.² C07D *213/55*
U.S. Cl. 260—295 R 35 Claims

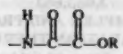
1. A compound of the formula



and



wherein each



group is located anywhere on the carbon ring with the proviso that one group cannot be ortho to the other group;

R is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, phenyl, and a pharmaceutically acceptable metal or amine cation;

X and Y are the same or different and are selected from the group consisting of hydrogen, alkyl from one through four carbon atoms, phenyl, alkoxy from one through three carbon atoms, nitro, amino, trifluoromethyl, halogen, and

wherein D is selected from the group consisting of hydrogen and alkyl from one through six carbon atoms, and a pharmaceutically acceptable metal or amine cation with the proviso that when R is hydrogen or a pharmaceutically acceptable metal or amine cation, then D is the same as R and when R is alkyl from one through six carbon atoms or phenyl, then D is alkyl from one through six carbon atoms, phenyl or hydrogen;

and pharmaceutically acceptable acid addition salts thereof.

3,963,661
DIALLYL PHTHALATE RESIN-CONTAINING AQUEOUS EMULSIONS WITH THERMOSETTING VINYL EMULSIONS

Akio Suzui, Amagasaki; Shinji Nose, Kobe; Takashi Kodama, Matsuyama; Kenji Yokoyama, Amagasaki; Kazuya Matsumoto, Kobe, and Yoshiharu Fujio, Amagasaki, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed July 16, 1974, Ser. No. 488,926
Claims priority, application Japan, May 31, 1974, 49-62406
Int. Cl.² C08L *31/08, 35/02, 35/04*
U.S. Cl. 260—29.4 UA 3 Claims

1. A diallyl phthalate resin-containing aqueous emulsion product containing:

A. an aqueous emulsion of a diallyl phthalate resin having a degree of conversion of monomer to polymer of from 30 to 75 weight percent, said diallyl phthalate resin consisting of

1. diallyl phthalate present in from 50 to 100 weight percent, and
2. an alkyl acrylate present in from 50 to 0 weight percent; and

B. an aqueous emulsion of a thermosetting vinyl resin consisting of a copolymer of

1. a vinyl compound present in from 10 to 1 weight percent and containing a thermosetting functional moiety selected from the group consisting of glycidyl, N-methylol, N-alkoxymethyl, carboxyl, hydroxyl, amino, and amide, and
2. a vinyl compound present in from 90 to 99 weight percent and not containing a thermosetting functional moiety and selected from the group consisting of C_{1-8} alkyl esters of α,β-unsaturated carboxylic acid, vinyl esters, aromatic vinyl compounds, and α,β-unsaturated nitriles,

said product containing from 10 to 70 weight percent of the resin of A) and from 90 to 30 weight percent of the resin of B), based on the total resin content.

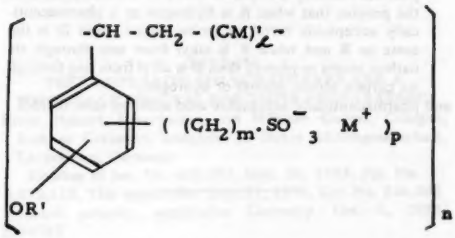
3,963,662
POLYION COMPLEX AND PROCESS FOR PREPARATION THEREOF

Hiroshi Fujiwara, Soka; Masaaki Sekiya, Satte, and Hiroshi Suzuki, Ichikawa, all of Japan, assignors to Maruzen Oil Co. Ltd., Osaka, Japan

Filed Mar. 13, 1974, Ser. No. 450,641
Claims priority, application Japan, Mar. 13, 1973, 48-29830; Mar. 13, 1973, 48-29831
Int. Cl.² C08L 61/10, 27/22
U.S. Cl. 260—29.6 WB 18 Claims

1. A process for preparing a polyion complex, which comprises reacting at 0° to 100°C

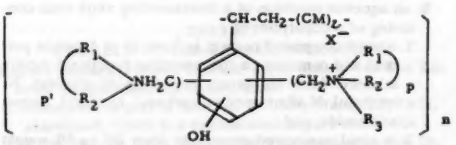
a. a polyanion selected from the group consisting of polymers expressed by the following general formula



wherein *p*, *l* and *n* are the same as defined in section b) below *m* is 0 or 1; M is —H, an ammonium group, an alkali metal, or an alkaline earth metal; R′ is H, or —$SO_3^-M^+$, M^+ or a combination thereof; OR′ is para or meta to the vinyl group of the starting hydroxystyrene; and (CM)′ is styrene, methyl methacrylate, methyl acrylate, acrylonitrile, or maleic anhydride,

polystyrene sulfonic acid, polyvinyltoluene sulfonic acid, polyvinylsulfonic acid, and alkali metal salts or alkaline earth metal salts of the above acid-type polyanions; with

b. a polycation with a polycation of the following general formula



wherein OH is para or meta to —CH—CH_3, each of R_1, R_2 and R_3 is an alkyl group, cycloalkyl group, alkenyl group, benzyl group, substituted benzyl group, or any of these groups in which a hydroxyl group has been introduced;

forms a nitrogen-containing or oxygen-containing heterocyclic group, or represents a dialkanolamine or N-alkylalkanolamine; R_3 is CH_3COOH, H, or O forming a coordination bond with N of a quaternary ammonium group; X is halogen or $ROSO_3$, wherein R is a lower alkyl group; *p* is above 0 but below 2, *p′* is at least 0 but below 2, and the sum of *p* and *p′* is above 0 but below 2; *n* is at least 3; (CM) represents a vinyl monomer; and *l* is any number including 0 in a solvent wherein the concentration of the polycation and the polyanion in the solvent is 0.01 to 80% by weight.

3,963,663
ELECTRODEPOSITION OF THERMOSETTING COATINGS AT THE CATHODE

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 26, 1974, Ser. No. 464,411
Int. Cl.² C08L 61/06
U.S. Cl. 260—29.3 14 Claims

1. An aqueous coating composition comprising water having dispersed therein an hydroxy functional cationic polyamine resin comprising resinous hydroxy functional polyepoxide having a 1,2-epoxy equivalency of at least about 1.4, said polyepoxide being adducted with a stoichiometric deficiency of diisocyanate with respect to hydroxy and in a molar ratio of diisocyanate to polyepoxide of from 0.8:2 to 1.1:2 to provide an epoxy urethane containing unreacted epoxy groups, said epoxy urethane being adducted with a diprimary amine in which the two primary amine groups are the only functionality present, in an amount of about 1 mol of the diamine per equivalent of epoxy functionality, to consume substantially all of the epoxy functionality of said polyepoxide and generate hydroxy and terminal amine groups, said polyamine resin being condensed with from 2 to 60percent, based on the total weight of resin, of a water dispersible heat-hardening phenol-formaldehyde resin, and said condensed resin being dispersed in said water with the aid of water miscible organic solvent and an acid which solubilizes said resin.

3,963,664
METHOD OF PREPARING AROMATIC POLYAMIDE SOLUTIONS

Shuji Ozawa; Akihiro Aoki, and Hiroshi Fujie, all of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 452,329, March 18, 1974, abandoned, which is a continuation of Ser. No. 253,802, May 16, 1972, abandoned. This application May 12, 1975, Ser. No. 576,661
Int. Cl.² C08K 5/34
U.S. Cl. 260—30.2 8 Claims

1. A method of preparing a homogeneous solution of a polymer whose recurring structural units are predominantly metaphenylene isophthalamide units, comprising:

A. blending at a temperature of from −20°C to 10°C,

1. a fiber-forming polymer in which at least 90 mol percent of the total recurring structural units are metaphenylene isophthalamide units, and
2. A solvent consisting of at least 80% by weight of N-methyl-2-pyrrolidone, in the substantial absence of inorganic salts and at a polymer concentration of from 15 to 30 percent by weight based on the total weight of the polymer and the solvent, to form a uniform slurry, and

B. heating the slurry to a temperature between not below the temperature T_1 and not exceeding the temperature T_2 but not higher than 130°C, thus forming the solution;

wherein

$$T_1 = -18 + 3C - 1.5X,$$

and

$$T_2 = 330 - 10C + 7X,$$

both T_1 and T_2 being in degrees centigrade, C being the weight percent of polymer in the blend, and X being the mol percent of recurring structural units other than metaphenylene isophthalamide.

3,963,665

NONEL CONVEYOR BELTS FOR TRANSPORTING TAR SANDS

Jackson S. Boyer, Wilmington, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 25, 1974, Ser. No. 509,205
Int. Cl.² C08K 5/06, 5/12
U.S. Cl. 260—31.8 C 8 Claims

1. An improved rubber composition suitable for use over a wide range of temperatures and resistant to excess swelling when exposed to liquid hydrocabons containing up to 30 volume percent aromatics comprising a vulcanized mixture of:

a. 100 parts of a rubber mixture comprised of 20 to 95 weight percent nitrile rubber and 80 to 5 weight percent of a second rubber selected from the group consisting of polybutadiene, styrene-butadiene copolymer, neoprene, polyisoprene and natural rubber, said rubber mixture having an acrylonitrile content in the range of 5 to 35 weight percent and

b. 1 to 30 parts by weight of a liquid plasticizing agent selected from the group consisting of di(butoxy-ethoxy ethyl) formal and di(butoxy-ethoxy ethyl) adipate, said vulcanized mixture being characterized as having a volume percent swell after 24 hours at 158°F in ASTM number 3 oil in the range of 1 to 40 as measured according to ASTM D-471 and a Gehman T_{100} stiffness value in the range of −30°F to −100 °F as measured according to ASTM D-1053.

3,963,666

STORAGE-STABLE, QUICK-CURING EPOXIDE RESIN MOULDING MATERIALS

Bruno Schreiber; Wolfgang Seiz, both of Basel, and Ewald Forster, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 257,749, May 30, 1972, abandoned.
This application Apr. 24, 1975, Ser. No. 571,143
Claims priority, application Switzerland, June 15, 1971, 8703/70
Int. Cl.² C08L 63/00
U.S. Cl. 260—37 EP 14 Claims

1. Storage-stable, one package quick-curing epoxide resin moulding materials consisting essentially of:

a. pre-adducts containing aromatic constituents and free epoxide groups and formed from epoxide resins and polyamines,

b. pre-adducts containing free amino groups and formed from polyamines containing cycloaliphatic or heterocyclic groups with polyglycidyl compounds, as curing agents, wherein the ratio of the number of reactive hydrogen atoms of the polyamine on the amine nitrogen atoms to that of the epoxide groups of the epoxide is in the range of 3:1 to 5:1, and

c. mineral or organic pulverulent or fibrous fillers, with the epoxide resin pre-adducts and the curing agents softening between 45° and 120°C, and melting 5° to 30°C above the softening point, and the resin pre-adducts and the curing agents being present in the moulding materials predominantly as discrete particles.

3,963,667

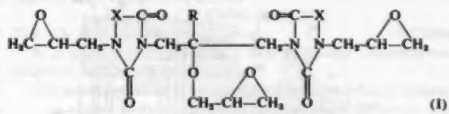
STORAGE-STABLE MOULDING COMPOSITIONS FOR THE MANUFACTURE OF LIGHT-STABLE, TRACKING-RESISTANT PLASTICS

Bruno Schreiber, Basel; Hermann Diethelm, Aesch; Jurgen Habermeier, Pfeffingen, and Ewald Forster, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,489
Claims priority, application Switzerland, Nov. 6, 1973, 15599/73
Int. Cl.² C08L 63/00
U.S. Cl. 260—37 EP 24 Claims

1. Storage-stable moulding composition, characterized in that it contains

a. an adduct, containing epoxide groups, of a triglycidyl compound of the formula I



(I)

wherein X denotes a divalent alkylene group required to form a 5-membered or 6-membered heterocyclic structure and R denotes hydrogen or an alkyl group with 1 to 4 carbon atoms, and an organic compound possessing two or more active hydrogen atoms, selected from the group consisting of an aromatic primary monoamine, an aliphatic primary monoamine with 2 to 10 carbon atoms, a cycloaliphatic primary monoamine, a cycloaliphaticaliphatic primary monoamine, a heterocyclic-aliphatic primary monoamine, a mononuclear or binuclear hydantoin, a mononuclear or binulcear dihydrouracil, a dialcohol, a mononuclear or polynuclear phenol with 2 hydroxyl groups or a dicarboxylic acid, as the resin,

b. an adduct, containing amino groups, of a cycloaliphatic, aliphatic-cycloaliphatic, aromatic or heterocyclic polyamine and a polyglycidyl compound, as the curing agent, and

c. a mineral or organic, pulverulent or fibrous filler, and that the resin adduct and the curing agent adduct soften at between 45° and 120°C and melt 5° to 30°C above the softening point.

3,963,668

REINFORCED POLYOXYMETHYLENE MOLDING COMPOSITIONS

Rolf Wurmb, Heidelberg; Franz Schmidt, Mannheim, and Harro Petersen, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 13, 1975, Ser. No. 549,660
Int. Cl.² C08K 9/04
U.S. Cl. 260—37 AL 4 Claims

1. An improved glass-fiber reinforced polyoxymethylene which contains, in addition to said polyoxymethylene and said glass fibers from 0.1 to 5% by weight based on the total weight of the composition of an alkoxymethyl urea.

3,963,669

GLASS-FIBER-REINFORCED POLYESTER MOLDING COMPOSITIONS OF REDUCED FLAMMABILITY

Rolf Wurmb, Heidelberg; Joachim Kunde, Frankenthal, and Wolfgang Seydl, Hamburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 13, 1975, Ser. No. 549,659
Int. Cl.² C08K *3/34, 3/40*
U.S. Cl. 260—40 R **4 Claims**

1. Glass-fiber-reinforced molding compositions of reduced flammability consisting of

A. a linear saturated polyester resin,

B. from 10 to 60% by weight of glass fibers,

C. from 3 to 30% by weight of a flame retardant and, additionally,

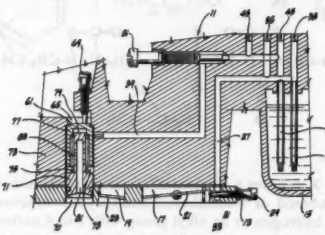
D. from 2 to 10% by weight, based on the total weight of the molding composition, of a particulate water-insoluble silicate having a bulk density of more than 100 g/l.

3,963,670

INTEGRATED IDLE AND BY-PASS SYSTEM

Ralph E. Kalert, Granite City, Ill., and Robert J. Smith, Florissant, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,250
Int. Cl.² F02M *3/02*
U.S. Cl. 261—41 D **3 Claims**



1. A carburetor to be mounted on an intake manifold of an internal combustion engine to provide a fuel/air mixture to be sucked into the intake manifold by an intake manifold vacuum, said carburetor including:

a main fuel/air mixing bore in communication with outside atmosphere;

a fuel supply bowl;

a throttle valve located in said mixing bore for moving between an open and a closed position and thereby controlling fluid flow through said mixing bore, wherein, when said throttle valve is in said "closed" position, fluid flow through said main fuel/air mixing bore is virtually prevented;

an idle fuel supply circuit for providing communication between said fuel supply bowl and said main fuel/air mixing bore, said idle fuel supply circuit entering said main fuel/air mixing bore at a dynamic air idle port which is located adjacent said throttle valve so that fluid flow in said main fuel/air mixing bore past said dynamic air idle port is effected by movement of said throttle valve, and fuel flow from said dynamic air idle port into said main fuel/air mixing chamber is, in turn, effected; and

a supplementary fuel/air supply circuit comprising:

an air passageway defining means for defining a supplementary air passageway leading from a point upstream of said throttle valve to a point downstream of said throttle valve;

a fuel passageway defining means for defining a separate supplementary fuel passageway from said fuel supply bowl to said supplementary air passageway, said supplementary fuel passageway entering said supplementary air passageway at a mixing intersection;

a piston valve located in a piston chamber portion of said supplementary air passageway upstream of said mixing intersection, said piston valve being movable in said piston chamber portion between a blocking position wherein said piston valve substantially blocks air flow through said supplementary air passageway, and an open position wherein said piston valve allows substantial free air flow through said supplementary air passageway;

a biasing spring for biasing said piston valve toward said blocking position;

a manifold vacuum passageway defining means for defining a manifold vacuum passageway between said piston chamber portion and said intake manifold, said manifold vacuum passageway entering said piston chamber portion at such a location that a predetermined high manifold vacuum acting through said manifold vacuum passageway under idle conditions overcomes said biasing spring and moves said piston valve toward an open position; and

a plug which is screwed into a main housing of said carburetor behind said piston valve, said plug including a protruding portion thereof which extends into a hollow portion of said piston valve, said plug defining a central bore and an opening communicating with said central bore through said protruding portion of said plug so that said opening provides communication between said central bore and said hollow portion of said piston valve, and wherein said central bore communicates with an intake manifold vacuum and the length of said protruding portion is calibrated so as to provide a stop for said piston valve when it is in an open position.

3,963,671

FIRE-RETARDANT THERMOSETTING RESINOUS COMPOSITIONS

Roy G. Turnbo, Deer Park, Tex., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Aug. 28, 1974, Ser. No. 501,348
Int. Cl.² C08K *1/00*
U.S. Cl. 260—45.7 R **5 Claims**

1. A fire-retardant composition that comprises a thermosetting organic resin selected from the group consisting of epoxy resins, polyesters, phenolic resins, amino-aldehyde resins, and mixtures thereof and a fire-retarding amount of hexabromobutadiene.

3,963,672

FLAME-RETARDANT POLYVINYL FLUORIDE FILM

Donald Eugene Brasure, Tonawanda, N.Y., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed July 16, 1975, Ser. No. 596,232
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.75 B **5 Claims**

1. A flame-retardant polyvinyl fluoride flim containing, as the sole flame-retardant additive, about 3 to 30% by weight of at least one sodium antimonate, potassium antimonate, zinc antimonate, magnesium antimonate, or aluminum antimonate.

3,963,673

POLYMER CROSSLINKING WITH COUPLED PEROXIDES

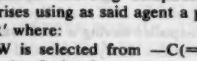
Antonio Joseph D'Angelo, Buffalo; Orville Leonard Mageli, and Chester Stephen Sheppard, both of Kenmore, all of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 342,106, March 16, 1973, Pat. No. 3,846,396, which is a division of Ser. No. 737,359, June 17, 1968, Pat. No. 3,725,455. This application June 25, 1974, Ser. No. 482,942
Int. Cl.² C08F *8/00, 210/16;* **C08G** *18/86;* **C08J** *3/24*
U.S. Cl. 260—46.5 G **11 Claims**

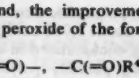
1. In the process of crosslinking elastomers capable of being crosslinked by free radicals using as the crosslinking agent a

free radical affording compound, the improvement which comprises using as said agent a peroxide of the formula R—W—R′ where:

a. W is selected from —C(=O)—, —C(=O)R⁴C(=O)—, —C(=O)C(=O)—,



and



b. R and R′ are identical and are selected from $R_3OO-C(R_1)(R_2)-R^2O-$, $(R_3OO)_2C(R_4)-R^2O-$, $R_3OOC(=O)R^2O-$, $R_3OOC(=O)OR^2O-$, $R_1OC(=O)OO-C(R_1)(R_2)-R^2O-$, and $R_1C(=O)OO-C(R_1)(R_2)-R^2O-$;

c. R_1 and R_2 are aliphatic having 1–12 carbon atoms, cycloaliphatic having 3–12 carbon atoms, or aromatic having 6–12 carbon atoms;

d. R_3 is aliphatic or cycloaliphatic, each having 4-10 carbon atoms and the carbon atom joined to the peroxy oxygen atom is a tertiary carbon atom;

e. R_4 is aliphatic having 1–10 carbon atoms or cycloaliphatic having 3–12 carbon atoms;

f. R_5 is lower alkyl, cycloalkyl, aryl, alkoxy, cycloalkoxy, aralkoxy, or aryloxy;

g. R_6 is H or lower alkyl;

h. Y is the diradical O, S, or N—R_6;

j. R^2 is an aliphatic diradical having 1–10 carbon atoms or a cycloaliphatic diradical having 3–12 carbon atoms;

k. R^3 is an aliphatic diradical having 1–10 carbon atoms, cycloaliphatic diradical having 3–12 carbon atoms, aromatic diradical having 6–12 carbon atoms, or araliphatic diradical having 7–16 carbon atoms;

l. R^4 is selected from R^3, YR^3Y, $R^3C(=O)YR^3YC(=O)R^3$, $YR^3YC(=O)YR^3YC(=O)YR^3Y$, $YR^3YC(=O)R^3C(=O)YR^3Y$, $YR^3C(=O)YR^3C(=O)YR^3Y$, $YR^3C(=O)YR^3YC(=O)R^3Y$, $YR^3YC(=O)YR^3Y$, $YR^3YC(=O)R^3Y$ and YR^3YR^3Y; and

m. R_7 and R_8 are selected from H, alkyl of 1–10 carbons and cycloalkyl of 3–12 carbons and, when R_7 is H, R_8 can also be aryl of 6–12 carbons, and R_7 and R_8 when taken together form alkylene of 2–11 carbons.

3,963,674

PROCESS FOR THE PRODUCTION OF HALOGENATED CARBOXYLIC ACID AMIDES

Otto Konigstein, and Herbert Jenkner, both of Cologne, Germany, assignors to Chemische Fabrik Kalk GmbH, Germany

Filed Mar. 7, 1975, Ser. No. 556,429

Claims priority, application Germany, Mar. 13, 1974, 2411904

Int. Cl.² C07C *103/02*

U.S. Cl. 260—561 HL **9 Claims**

1. Process for the production of halogenated carboxylic acid amides, comprising reacting an amide of an unsaturated aliphatic carboxylic acid with an anhydrous hydrogen halide, adding an epoxide compound to the reaction mixture, and after cooling, separating the precipitated halogenated carboxylic acid amide.

3,963,675

CYCLOPENTENES, PROCESS THEREFOR AND ODORANT COMPOSITIONS THEREWITH

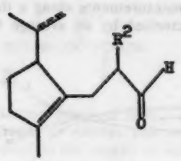
Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 338,730, March 7, 1973, abandoned. This application July 19, 1974, Ser. No. 490,166

Int. Cl.² C07C *47/40*

U.S. Cl. 260—598 **6 Claims**

1. A cyclopentene of the formula



(Ia)

wherein R^2 represents a hydrogen atom or a lower alkyl or lower alkylidene group and the broken line denotes an optional bond.

3,963,676

NOVEL PROCESS FOR PREPARING OXYMETHYLENE POLYMER AND RESULTING PRODUCT

Masaru Yoshida; Yoshiaki Nakase, and Akihiko Ito, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Japan

Division of Ser. No. 315,792, Dec. 18, 1972, Continuation-in-part of Ser. No. 144,636, May 18, 1971, Pat. No. 3,719,637. This application July 18, 1974, Ser. No. 489,548

Claims priority, application Japan, May 20, 1970, 45-42381; July 4, 1970, 45-58143

Int. Cl.² C08G *2/10, 2/02*

U.S. Cl. 260—67 FP **7 Claims**

1. A process for preparing a heat-stabilized oxymethylene polymer, consisting essentially of

polymerizing tetraoxane using as a polymerization initiator an organic nitro-compound selected from the group consisting of tetranitromethane, nitrobenzene, m-dinitrobenzene, 1,3,5-trinitrobenzene, and diphenyl picryl hydrazil,

said nitro-compound being present in an amount of about 10^{-6} to 70% by weight of the tetraoxane.

3,963,677

IMPERMEABLE SILICONE COMPOSITION

Carl C. Enger, 12700 Lake Ave., Lakewood, Ohio 44107

Filed Nov. 21, 1974, Ser. No. 525,925

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 D **28 Claims**

1. A plastic composition substantially impermeable to electrolytes comprising:

A. between about 50% and 95% by weight of a silicone polymer,

B. between about 1% and 40% by weight of a fluorocarbon polymer and

C. between about 0.1% and 25% by weight of a wax.

3,963,678

LARGE DENIER POLYETHYLENE TEREPHTHALATE MONOFILAMENTS HAVING GOOD TRANSVERSE PROPERTIES

Roddy Merl Conrad, Hamm, Germany, and Lyman Lyle Holland, Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

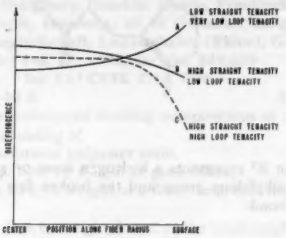
Filed June 17, 1974, Ser. No. 480,289

Int. Cl.² C08G *63/18, 63/70*

U.S. Cl. 260—75 T **2 Claims**

1. A polyethylene terephthalate monofilament having an intrinsic viscosity of 0.6 to about 1, a denier of 1000 to 10,000, a straight tenacity of 6.0 to 10.0 grams per denier, a loop tenacity of 5.0 to 7.0 grams per denier, and an internal structure which is substantially uniform except for lower polymer chain segment orientation near the surface as evidenced

by birefringence measurements along a diameter, the structure being characterized by an average birefringe ($\overline{\Delta n}$) of



0.190 to 0.196, and an average difference factor (δ) of 90 to 200.

3,963,679

PROCESS FOR THE PRODUCTION OF POLYURETHANE ELASTOMERS

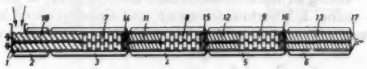
Martin Ullrich; Ernst Meisert, both of Leverkusen, and Alfred Eitel, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 433,589, Jan. 15, 1974, abandoned. This application July 17, 1974, Ser. No. 489,204

Claims priority, application Germany, Jan. 19, 1973, 2303564

Int. Cl.² C08G *18/08*; D01F *6/26*

U.S. Cl. 260—75 NE **17 Claims**



1. In a process for the continuous production of polyurethane (urea) elastomers by simultaneous reaction and extrusion in screw extruders, wherein polyisocyanates, polyols and/or polyamines, optionally other compounds which contain an average of at least 1.8 Zerewitinoff-active groups and optionally a lubricant are

a. admixed to form a reaction mixture

b. the reaction mixture is mixed under the action of high shearing forces, and

c. thereafter, the reaction mixture is formed by extrusion,

the improvement comprising kneading the reaction mixture at kneading frequencies of 1 to 20 Hertz and high velocity gradients in the radial clearance between the comb and housing wall of more than 2000 sec^{-1} during the time that the reaction mixture has a viscosity of between 100 Poises and 1000 Poises.

3,963,680

ONE-PART, ROOM-TEMPERATURE LATENT, CURABLE ISOCYANATE COMPOSITIONS

Donald R. O'Keefe, St. Paul, and A. Joseph Gasper, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 17, 1975, Ser. No. 559,238

Int. Cl.² C08G *18/18*, *18/82*, *18/00*

U.S. Cl. 260—77.5 NC **19 Claims**

1. In a one-part, room-temperature latent, curable isocyanate composition comprising:

an aromatic polyisocyanate material; and

an encapsulated liquid trimerization catalyst dispersed throughout said polyisocyanate, said liquid catalyst comprising a solution of a metal salt of an organic acid in a lower polyhydric alcohol and having a viscosity of greater than about 5,000 centipoise at 25°C, said liquid catalyst being encapsulated in capsules having a shell wall comprising partially polymerized isocyanate, said capsule shell wall being impermeable to said liquid catalyst at room temperature but permeable to said catalyst when activated by heat or solvent means;

the improvement comprising the inclusion in said liquid catalyst of a primary or secondary organic polyfunctional amine in an amount of from about 1 to 25% by weight of said liquid catalyst, wherein said partially polymerized isocyanate contains linkages selected from the group consisting essentially of urea, urethane and isocyanate linkages.

3,963,681

URETHANE ELASTOMERS PREPARED FROM POLYETHERS HAVING A CERTAIN MOLECULAR WEIGHT DISTRIBUTION

Yoshio Kaneko, Higashi Murayama; Yoji Watabe, Kodaira; Tsutomu Matsunaga, Murayama; Shigeyuki Toki, Kodaira, and Yutaka Iseda, Tachikawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed June 27, 1974, Ser. No. 483,535

Claims priority, application Japan, July 3, 1973, 48-75551

Int. Cl.² C08G *18/48*

U.S. Cl. 260—77.5 AM **14 Claims**

1. Polyether urethane elastomer composition having improved mechanical properties prepared by using polyfunctional isocyanate, curing agent and polyether having active hydrogen terminal groups which can react with the isocyanate group, wherein weight average molecular weight of said polyether is within the range of 1,000 to less than 4,500 and the molecular weight distribution curve of said polyether has at least two peaks, at least one of which is located in the higher molecular weight region and at least another one of which is located in the lower molecular weight region than the critical molecular weight of said polyether and wherein the equivalent ratio (d) of active hydrogen of a curing agent to the isocyanate group of said polyfunctional isocyanate is in the range of $0.9<d<1.2$.

3,963,682

POLYMERIC FUNGICIDAL COMPOSITIONS CONTAINING THE TRICHLOROMETHYL THIOIMIDE MOIETY

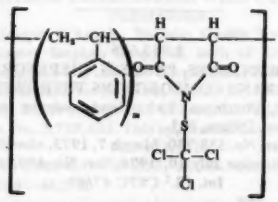
Wayne L. Gindrup, Houston, Tex., assignor to Napko Corporation, Houston, Tex.

Filed Feb. 26, 1973, Ser. No. 335,665

Int. Cl.² C08F *12/08*, *22/40*

U.S. Cl. 260—78 UA **2 Claims**

1. A Polymeric, resinous fungicide consisting essentially of repeating units having the formula:



where n is 2 to 6 and m is 1 to 3.

3,963,683
RUBBER FORMULATIONS CONTAINING VULCANIZATION INHIBITING THIOFORMAMIDINE COMPOUNDS

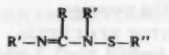
Marion J. Gattuso, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 464,584, April 26, 1974, Pat. No. 3,879,459. This application Dec. 17, 1974, Ser. No. 533,574

Int. Cl.² C08C *11/54*; C08D *9/00*

U.S. Cl. 260—79.5 A 10 Claims

1. A vulcanizable diene rubber composition containing, as an inhibitor against the premature vulcanization thereof, a substituted thioformamidine having the formula:



in which the R's are independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl and aralkyl radicals.

3,963,684
VINYL BENZYL ETHERS AND NONIONIC WATER SOLUBLE THICKENING AGENTS PREPARED THEREFROM

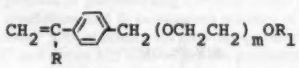
Syamalarao Evani, and Frederick P. Corson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 267,571, June 29, 1972. This application July 18, 1974, Ser. No. 489,876

Int. Cl.² C08F *220/56*

U.S. Cl. 526—303 2 Claims

1. A nonionic water soluble polymeric thickening agent comprising in polymerized form about 1 to 5 mole percent of a vinyl benzyl ether monomer and the balance to make 100 percent of acrylamide, said ether monomer having the formula



wherein R is hydrogen or methyl, *m* is about 10 to 100 and R_1 is an alkyl, alkaryl or aralkyl group of Lb 10 to about 22 carbon atoms.

3,963,685
ALCOHOL SOLUBLE HYDROPHILIC POLYMER VIA AQUEOUS POLYMERIZATION

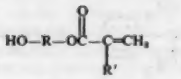
Robert A. Abrahams, 12 Amherst Road, Malboro, N.J. 07746

Filed May 13, 1974, Ser. No. 469,161

Int. Cl.² C08F *216/04*, *220/20*

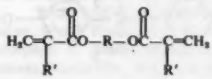
U.S. Cl. 526—230 16 Claims

1. A process for preparing a solid waterinsoluble, methanol-soluble hydrophilic polymer which consists essentially of polymerizing in water, monomers consisting essentially of (a) a monomer of the formula



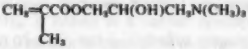
(1)

where R is an alkylene group of 2 to 3 carbon atoms, and wherein R' is hydrogen or methyl; with not more than 0.035 weight percent, based on the weight of said monomer of formula (1), of a diester of the formula



(2)

wherein R and R' have the above meanings or (b) said monomers of formula (1) and formula (2) together with a third monomer in an amount as high as 10%, said third monomer being methacrylic acid or



initiating polymerization by irradiation or a free radical initiator employing a ratio of total monomer to water from 10:90 to 70:30, conducting the polymerization for a period of time sufficient to produce said polymer, and recovering said polymer from the resulting reaction product mixture.

3,963,686
HEAT-CURABLE PULVERULENT COATING AGENT CONSISTING OF A MIXTURE OF COMPOUNDS CONTAINING GLYCIDYL GROUPS, DICARBOXYLIC ACID ANHYDRIDES, CURING ACCELERATORS, FLOW CONTROL AGENTS AND OPTIONALLY FURTHER CUSTOMARY ADDITIVES

Themistoklis Katsimbas, Hamburg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed May 30, 1974, Ser. No. 474,532

Claims priority, application Switzerland, June 26, 1973, 9315/73

Int. Cl.² C08G *45/04*

U.S. Cl. 260—837 R 1 Claim

1. Pulverulent coating agent of a mixture of

A. a component which consists of 84 to 94 percent by weight of polyepoxides which have Durran softening points of about 90°–110°C and are soluble in organic solvents, and have the general formula

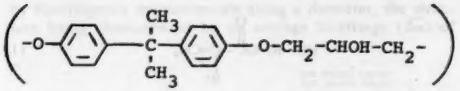
wherein

if A is (—OOC—R_1—COO—CH_2—CHOH—CH_2—)
then B represents (—OOC—R_1—COO),

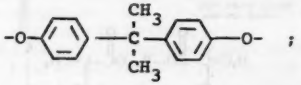
wherein R_1 represents an aliphatic or aromatic hydrocarbon radical and *n* is zero or a small number from zero to eight; or

if A is (—O—R_1—O—CH_2—CHOH—CH_2—),
then B denotes (—O—R_1—O—) and R_1 has the meaning already mentioned, or

if A represents



then B is



B. consisting of 6 to 16 percent by weight of at least one dicarboxylic acid anhydride with melting point of about 60°–140°C in an amount corresponding to 0.4 – 1.0 anhydride groups per epoxy group (glycidyl group) of the component (A),

C. a curing accelerator in the form of an organic base and optionally

D. a flow control agent in an amount of at least 0.05 percent by weight of the mixture, which agent is a polymer of molecular weight (M_n) of at least 1,000 and has a glass transition temperature which is at least 50°C lower than the glass transition temperature of the component (A), characterized in that the component (C) consists of 0.5 – 1.8 percent by weight of N',N'-bis-(dimethylaminoisobutylidene)-melamine.

3,963,687

TWO STEP CONTINUOUS POLYMERIZATION METHOD TO FORM ACRYLONITRILE COPOLYMERS

Ronald Luther Saxton, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 2, 1975, Ser. No. 538,160
Int. Cl.² C08F 2/16, 220/44
U.S. Cl. 526—66 29 Claims

1. A method of polymerization comprising

a. into a first reactor continuously feeding a free radical initiator and aqueous emulsified chain transfer agent, acrylonitrile and at least one monomer of styrene; 4-methyl styrene; 4-(t-butyl)styrene; 3-methyl styrene; 2,4-dimethyl styrene; 2,6-dimethyl styrene and 2,4-diisopropyl styrene or alpha-methyl styrene in combination with one of the above monomers; whereby at least 95% of the reaction time the monomer content relative to acrylonitrile in the reactor is maintained within 25% of a ratio required to be maintained to produce a polymer with an average composition of 65% to 85% by weight polymerized units of acrylonitrile and 35 to 15% by weight polymerized units of said monomer, said first reactor having a reaction temperature between 50 to 75°C.,

b. from said first reactor continuously withdrawing an outlet stream containing a polymer solids content of 15 to 20% by weight, an emulsifier content of 4 to 7% by weight of polymer, and unreacted acrylonitrile of 45 to 60% by weight of acrylonitrile feed to the first reactor;

c. into a second reactor continuously feeding the outlet stream from step (b) together with free radical initiator and added aqueous emulsified chain transfer agent, acrylonitrile and said monomer with emulsifier present in an amount of at least 0.2% by weight of added water exclusive of water from step (b) whereby at least 95% of the reaction time a monomer content relative to acrylonitrile is maintained in the second reactor within 25% of a ratio required to be maintained to produce a polymer with an average composition of 65% to 85% by weight polymerized units of acrylonitrile and 35 to 15% polymerized units of said monomer, said second reactor having a reaction temperature between 50° to 75°C.;

d. from said second reactor continuously withdrawing an outlet stream containing a polymer solids content of 20 to 30% by weight, an emulsifier content of 1.3 to 2.5% by weight of polymer, and unreacted acrylonitrile of 10 to 30% by weight of acrylonitrile feed to the second reactor, a ratio of polymer production in the second reactor to the first reactor maintained in a range of 1:1 to 6:1; the polymer possessing a melt stability of at least 10 minutes, an inherent viscosity of 0.3 to 1.0 deciliter/g as measured on a 0.5 g/deciliter solution of the polymer in gammabutyrolactone at 35°C., a melt viscosity of 10^4 to 10^6 poises at 220°C. and a carbon dioxide permeability of less than 0.045 barrer and containing 65 to 85% by weight polymerized units of acrylonitrile and 35 to 15% by weight polymerized units of said monomer.

3,963,688

METHOD OF EMULSION POLYMERIZATION USING PHOSPHATE ESTERS OF NORMAL ALKANOLS AS SURFACTANT

Donald H. Lorenz, Basking Ridge, N.J., and Earl P. Williams, Pen Argyl, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,333
Int. Cl.² C08F 14/06, 214/06, 218/08
U.S. Cl. 526—193 12 Claims

1. In a process for the emulsion polymerization of at least one olefinic monomer containing at least one olefinic carbon-to-carbon double bond, wherein said monomer is polymerized in an aqueous medium in the presence of a surfactant and a water-soluble initiator, the improvement wherein the surfactant is selected from the group consisting of phosphate esters having the formula

(I)

and

(II)

and mixtures of (I) and (II) thereof, wherein M is hydrogen, alkali metal, or an ammonium or amino cation having the formula

wherein R^1, R^2 and R^3 are independently hydrogen, alkyl of 1 to 6 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 6 carbon atoms and R is a straight chain alkyl of 8 to 10 carbon atoms.

3,963,689

POLYMERIC MATERIALS

Gerardus Johannes Van Veersen, Gaude, Netherlands, assignor to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 327,287, Jan. 29, 1973, Pat. No. 3,881,867. This application Jan. 28, 1975, Ser. No. 544,724

Int. Cl.² C08L *23/12, 67/00*

U.S. Cl. 526—6 8 Claims

1. A polymeric material comprising a synthetic resin selected from the group consisting of polypropylene and polyester; and from 0.5 to 15 parts, per hundred parts of the resin a polymerized fatty acid nitrile containing 20 to 75 carbon atoms, 2 to 4 nitrile groups and a maximum of two carbon-carbon double bonds.

3,963,690

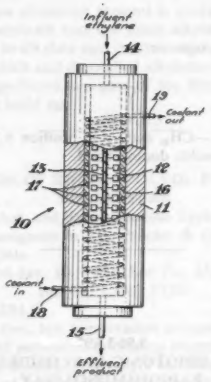
POLYMERIZATION OF ETHYLENE IN STIRRED AUTOCLAVE WITH COOLED INNER WALL

Malcolm E. Pruitt, Midland, Mich., and Joe B. Lovett, Sweeny, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 7, 1974, Ser. No. 512,642

Int. Cl.² C08F *4/28, 110/02*

U.S. Cl. 526—65 1 Claim



1. In a process of polymerizing ethylene under free-radical initiating conditions and in continuous manner at pressure of at least about 500 atmospheres and temperatures between about 125° and about 325°C at which the exothermic reaction of addition polymerization of ethylene is sustained without decomposition in a stirred autoclave comprising a relatively thick sidewall capable of withstanding the reaction pressure and defining at least one polymerization reaction zone, said continuous manner comprising continuously feeding ethylene to the reaction zone while stirring the resulting polymerization reaction mixture therein and continuously removing therefrom a portion of the resulting polymerization reaction mixture and sustaining the polymerization reaction in a substantially steady state,

the improvement wherein the polymerization reaction zone is bounded in part by a relatively thin heat conductive wall means having a first surface in contact with the polymerization reaction mixture contained in that zone and a second surface near to the first surface but separated therefrom by said heat conductive wall, the said heat conductive wall means being supported by the said autoclave sidewall and lying between said autoclave sidewall and the said polymerization reaction zone, the dimensions of said heat conductive wall means and said autoclave sidewall being thin and thick, respectively, relative to each other, and the process is carried out while passing a heat exchange fluid in contact with said second surface, said heat exchange fluid being at a temperature below that of the polymerization reaction mixture, thereby removing part of the heat generated by the exothermic polymerization reaction occurring in the reaction zone from the reaction mixture therein through the said heat conductive wall means to the said heat exchange fluid.

3,963,691

SYNTHETIC ANTIGENS OF LUTEINIZING HORMONE RELEASING HORMONE

Carl H. Hoffman, Scotch Plains, N.J.; Harvey Schwam, Lafayette Hill; Stephen F. Brady, Meadowbrook, both of Pa.; Martin Hichens, Somerville, N.J., and Ruth F. Nutt, Green Lane, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 7, 1974, Ser. No. 512,563

Int. Cl.² C07C *103/52;* C07G *7/00*

U.S. Cl. 260—112.5 LH 7 Claims

1. The antigen 1-N -glutaryl-LH-RH-[2-10]-carrier wherein the peptide 1-N -glutaryl-LH-RH-[2-10], having the amino acid sequence glutaryl-his-trp-ser-tyr-gly-leu-arg-pro-gly-NH_2, is linked to a carrier selected from the group consisting of α, β and γ globulins, thyroglobulins, Keyhole Limpet Hemocyanin, poly-L-glutamic acid, and poly-L-lysine by a peptide linkage between the carboxyl group of the glutaryl moiety and the amino groups of said carrier.

3,963,692

SULFUR-CHLORINATED POLYNUCLEAR AROMATIC AND FAT MIXTURE

Herbert D. Ivey, Jr., Pasadena, Calif., assignor to Lubricaton Company of America, Los Angeles, Calif.

Filed June 27, 1974, Ser. No. 483,657

Int. Cl.² C07G *17/00*

U.S. Cl. 260—125 7 Claims

1. An extreme pressure additive comprising the reaction product of, as a first ingredient, a cyclic oil obtained from the cracking of petroleum containing in major proportions polynuclear aromatics boiling between 350° and 800°F and having separated therefrom by sulfuric acid treatment the majority of impurities which form a permanent sludge when reacted with a normally liquid sulfur halide, and as a second ingredient, a fat product, said first and second ingredients being in a ratio of 1:1 to 4:1 and being reacted with a normally liquid sulfur halide to produce a sulfur-chlorinated product useful as an extreme pressure additive.

3,963,693

QUINOLONE AZO BARBITURIC ACID PIGMENTS

Rudolf Mory, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

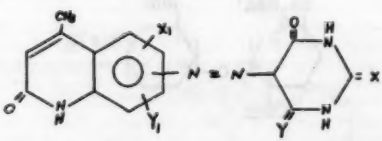
Filed Apr. 22, 1974, Ser. No. 462,834

Claims priority, application Switzerland, May 3, 1973, 6321/73

Int. Cl.² C09B *29/36;* D06P *1/08, 3/24, 3/60*

U.S. Cl. 260—154 5 Claims

1. A monoazo pigment of the formula



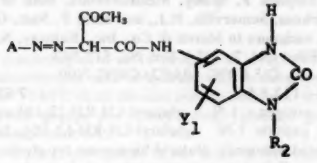
wherein X is O, S, or imino; Y is O or imino; and X_1 and Y_1 are hydrogen, chloro, alkyl containing 1–4 carbon atoms, or alkoxy containing 1–4 carbon atoms.

3,963,694
HYDROXYQUINOLYL- AND QUINAZOLONYLAZOACETOACETYLBENZIMIDAZOLONE PIGMENTS

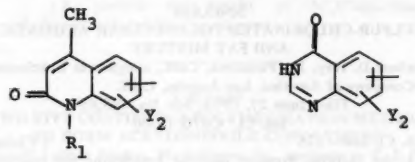
Rudolf Mory, Dornach, and Rolf Müller, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 230,978, March 1, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,830
Claims priority, application Switzerland, Mar. 3, 1971, 3125/71
Int. Cl.² C09B 29/36; D06P 1/08, 1/44
U.S. Cl. 260—154 4 Claims

1. An azo pigment of the formula



wherein A is an aryl selected from the group



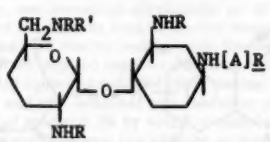
wherein Y_1 and Y_2 is hydrogen, chloro, bromo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms or nitro, R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, cyclohexyl, phenyl, or phenyl substituted by chloro, methyl or methoxy, R_2 is alkyl of 1 to 6 carbon atoms, cyclohexyl, phenyl, or phenyl substituted by chloro, alkyl of 1 to 6 carbon atoms, or alkoxy of 1 to 6 carbon atoms.

3,963,695
TETRADEOXYNEAMINE AND DERIVATIVES THEREOF

David J. Cooper, Downingtown, Pa., and Francis R. Pfeiffer, Cinnaminson, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Dec. 19, 1974, Ser. No. 534,247
Int. Cl.² C07H 15/22
U.S. Cl. 260—210 AB 6 Claims

1. A compound of the formula



where

R is hydrogen or a removable amino protecting group; and

R′ is hydrogen, methyl or ethyl

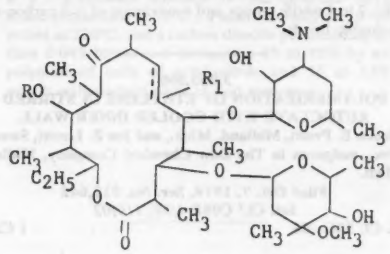
or a non-toxic pharmaceutically acceptable salt thereof.

3,963,696
6,6A-AND 6,7-ANHYDROERYTHROMYCIN B AND DERIVATIVES THEREOF

Jerry Roy Martin; John Soloman Tadanier, both of Waukegan, and Alma Whitman Goldstein, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 21, 1975, Ser. No. 551,818
Int. Cl.² C07H 17/08
U.S. Cl. 260—210 E 5 Claims

1. A compound having the formula



wherein R is hydrogen or

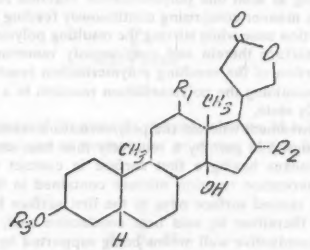
R_1 is $=CH_2$ or $-CH_3$, and --- in position 6,7 indicates the presence of a possible double bond.

3,963,697
LABELLED CARDIOTONIC GLYCOSIDES FOR USE IN RADIOIMMUNOASSAY

Robert F. Coombes, La Habra, Calif., assignor to Curtis Nuclear Corporation, Los Angeles, Calif.

Filed Aug. 29, 1974, Ser. No. 501,619
Int. Cl.² C07J 19/00
U.S. Cl. 260—210.5 21 Claims

1. A radioactive glycoside useful in radioimmunoassay of the formula:



wherein R_1 and R_2 are selected from the group consisting of hydroxyl or hydrogen and R_3 is selected from the group consisting of mono-, di-, tri-, and tetrasaccharides bonded to an ^{125}L-labeled substituent through a sugar hydroxyl group.

3,963,698
ALKYLATIONS EMPLOYING IN SITU GENERATION OF DIAZOALKANE ALKYLATION REAGENTS

Sidney M. Hecht, Cambridge, and John W. Kozarich, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 17, 1974, Ser. No. 434,142
Int. Cl.² C07B *27/00*
U.S. Cl. 260—211.5 R **21 Claims**

1. A process for in situ alkylation of a substrate comprising contacting a source of said substrate with an N-substituted, N-nitrosourea, said source being sufficiently basic to deprotonate said urea, and said urea being represented by the structural formula,

wherein

R represents the group to be added to said substrate and is selected from alkyl; cycloalkyl; heteroalkyl; aralkyl; and, heterocyclic;

whereby a diazo alkylation reagent is generated in the presence of said substrate and the diazo alkylation reagent and substrate react to alkylate said substrate at a rate at least equal to the rate at which said diazoalkyl alkylation reagent is generated so that significant amounts of the diazoalkyl alkylation reagent do not build up.

3,963,699
SYNTHESIS OF HIGHER POLYOL FATTY ACID POLYESTERS

George Peter Rizzi, and Harry Madison Taylor, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 10, 1974, Ser. No. 432,386
Int. Cl.² C08B *37/00*
U.S. Cl. 260—234 R **13 Claims**

1. A solvent-free, low temperature process for synthesizing polyol fatty acid polyesters consisting essentially of:

1. Heating a mixture of a polyol selected from the group consisting of monosaccharides, disaccharides and sugar alcohols, a fatty acid C_{1-2} alkyl ester, an alkali metal fatty acid soap, and a basic catalyst selected from the group consisting of alkali metal, alloys of alkali metals, alkali metal hydrides and alkali metal alkoxides to a temperature of from about 110°C to about 180°C at a pressure of from about 0.1 mm of Hg to about 760 mm of Hg to form a homogenous melt of partially esterified polyol and unreacted starting materials;
2. Under the conditions of Step (1) adding excess fatty acid lower alkyl esters to the reaction product of Step (1) to form the polyol fatty acid polyester; and
3. Separating the polyol fatty acid polyester from the reaction product of Step (2).

3,963,700
RECOVERY OF ANTHOCYANIN FROM PLANT SOURCES

Thomas Philip, Tucson, Ariz., assignor to University Patents, Inc., Stamford, Conn.

Filed July 1, 1974, Ser. No. 484,656
Int. Cl.² C07G *3/00*; A23L *1/27*
U.S. Cl. 260—236.5 **7 Claims**

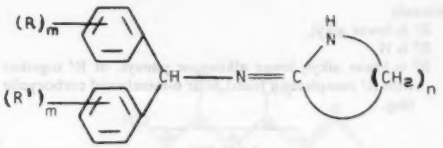
1. A method of separating anthocyanin from botanical sources which comprises drying said botanical sources to a moisture content not greater than 10%, extracting said sources with a solution of tartaric acid in a water-soluble alkanol containing not more than two carbon atoms, neutralizing 80–95% of the tartaric acid in the resulting extract with a potassium compound which reacts with the tartaric acid to yield potassium acid tartrate, removing the potassium acid tartrate from the extract, and then removing the alkanol to form an aqueous anthocyanin concentrate.

3,963,701
SUBSTITUTED BENZHYDRYL LACTAMIMIDE DERIVATIVES

Johann Martin Grisar, and Norbert Leonard Wiech, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 244,873, April 17, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 391,573
Int. Cl.² C07D *207/22*, *211/72*, *223/12*
U.S. Cl. 260—239 B **9 Claims**

1. A compound selected from a base of the formula



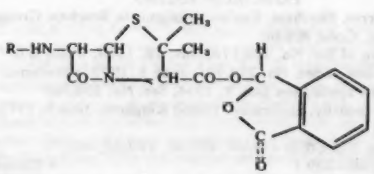
wherein *m* is a positive whole integer of from 1 to 3; *n* is a positive whole integer of from 3 to 7; each of R and R^1 is selected from the group consisting of hydrogen, a straight or branched lower alkyl chain of from 1 to 4 carbon atoms, a halogen atom, trifluoromethyl, trifluoromethylthio, trifluoromethoxy, phenyl, phenoxy, a lower alkoxy group of from 1 to 4 carbon atoms, with the proviso that both R and R^1 are not hydrogen and with the proviso that when m is equal to 1 and one of R and R^1 is hydrogen, the other of R or R^1 is not lower alkoxy of from 1 to 4 carbon atoms; and pharmaceutically acceptable acid addition salts thereof.

3,963,702
PHTHALIDE PENICILLIN ESTER INTERMEDIATES

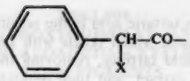
Harry Ferres, and John Peter Clayton, both of Horsham, England, assignors to Beecham Group Limited, Brentford, England

Division of Ser. No. 259,560, June 5, 1972, Pat. No. 3,860,579. This application Mar. 4, 1974, Ser. No. 447,672
Claims priority, application United Kingdom, June 9, 1971, 19604/71
Int. Cl.² C07D *499/32*
U.S. Cl. 260—239.1 **2 Claims**

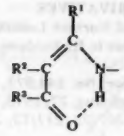
1. A compound of the formula:



wherein R is hydrogen or



in which X is NH_3^+, benzyloxycarbonylamino, N_3 or an enamine of the formula:



wherein

R^1 is lower alkyl,

R^2 is H,

R^3 is lower alkyl, lower alkoxy or phenyl, or R^2 together with R^1 completes a fused 5- or 6-membered carbocyclic ring.

3,963,703

TRIALKYLAMMONIUM -N-[β(1-AZIRIDINYL)] PROPIONOYLIMINES

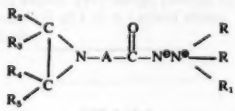
Billy M. Culbertson, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sept. 13, 1971, Ser. No. 180,098

Int. Cl.² C07D *203/12, 295/14*

U.S. Cl. 260—239 E **11 Claims**

1. A compound of the formula



wherein A represents the ethylene or propylene radical; R is alkyl; R_1 is alkyl or hydroxyalkyl; and R_2, R_3, R_4 and R_5 each represents hydrogen, aryl or alkyl.

3,963,704

PENICILLIN ESTERS

Harry Ferres, Horsham, England, assignor to Beecham Group Limited, Great Britain

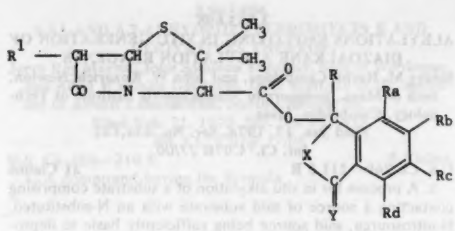
Division of Ser. No. 524,776, Nov. 18, 1974, which is a continuation of Ser. No. 259,941, June 5, 1972, abandoned. This application Dec. 9, 1974, Ser. No. 530,763

Claims priority, application United Kingdom, June 9, 1971, 19604/71

Int. Cl.² C07D *499/44, 499/46, 499/48, 499/70*

U.S. Cl. 260—239.1 **4 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable acid addition salt thereof:



(I)

wherein

a. X and Y are both sulphur; or

b. X is sulphur and Y is oxygen; or

c. X is oxygen and y is sulphur; and

wherein R is hydrogen, methyl or phenyl; Ra, Rb, Rc and Rd are selected from hydrogen, lower alkyl, lower alkoxy, halo and nitro and R^1 is an acylamino group selected from: phenylacetamido; p-hydroxyphenylacetamido; p-heptylphenylacetamido; phenoxyacetamido; α-phenoxypropionamido; α-phenoxybutyamido; 2,6-dimethoxyphenylacetamido; 3-phenyl-5-methyl-isoxazole-4-carbamido; 3-(2-chlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2,6-dichlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2-chloro-6-fluorophenyl)-5-methyl-isoxazole-4-carbamido; 2-ethoxy-naphthyl-1-carbamido; o, m or p-aminophenlyacetamido; 3-carboxy-quinoxalin-2-carbamido; 2-furylacetamido; 2-thienylacetamido; 3-thienylacetamido; 3-pyridylacetamido; isothiazolyacetamido; 3-hexenamido; 2-biphenylamido; n-hexanamido; n-octanamido; propionamido; α-aminophenylacetamido; α-amino-2-thienylacetamido; α-amino-3-thienylacetamido; α-methylaminoacetamido; α-amino-2- or -3-or -4-chlorophenylacetamido; α-amino-2-methoxyphenylacetamido; α-amino-2,4-dichlorophenylacetamido; α-amino-3,4-dichlorophenylacetamido; α-amino-α-methylphenylacetamido; α-amino-4-hydroxyphenylacetamido; α-amino-3-chloro-4-hydroxyphenylacetamido; α-methylphenylacetamido; α-hydroxyphenylacetamido; α-carboxyphenylacetamido; α-(5-tetrazolyl)phenylacetamido; α-guanidino-2-thienylacetamido; α-guanidino-4-hydroxyphenylacetamido; α-guanidino-4-hydroxy-2- or -3-methylphenylacetamido; α-carboxy-3-thienylacetamido; α-sulphaminophenylacetamido; α-sulphamino-3-thienylacetamido; α-(N-methylsulphamino)-phenylacetamido; α-azidophenylacetamido; 1-aminocyclohexylcarbamido; 1-aminocyclopentylcarbamido; 5-amino-5-carboxypentanamido; α-phenoxyphenylacetamido; α-phenyl-β-sulphaminopropionamido; α-sulphophenylacetamido; α-guanidinophenylacetamido; β-amino-β-cyclohexylpropionamido; α-(benzyloxycarbonyl)phenylacetamido.

3,963,705

PROCESS FOR THE PREPARATION OF 3-IMINOMETHYL DERIVATIVES OF RIFAMYCIN SV

Leonardo Marsili, and Carmine Pasqualucci, both of Milan, Italy, assignors to Archifar Industrie Chimiche del Trentino S.p.A., Rovereto, Italy

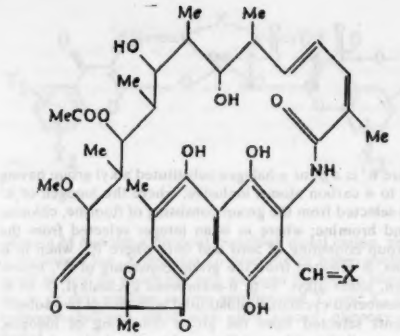
Filed May 23, 1974, Ser. No. 472,887

Claims priority, application Italy, July 25, 1973, 27066/73; Jan. 24, 1974, 19774/74

Int. Cl.² C07D *498/04*

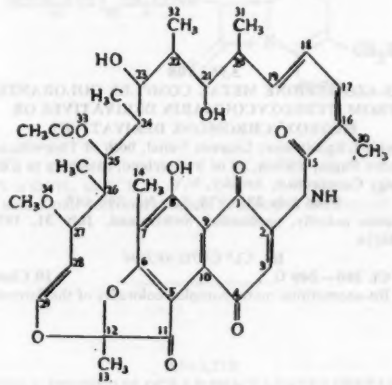
U.S. Cl. 260—239.3 P **10 Claims**

1. A process for the preparation of 3-iminomethyl derivatives of rifamycin SV of formula



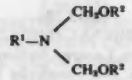
(III)

which comprises reacting rifamycin S of formula



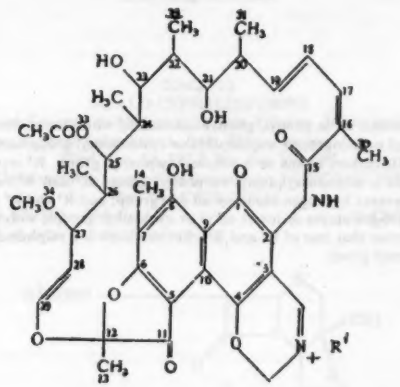
(II)

with a compound of formula



(V)

in which R^1 is lower alkyl, lower alkenyl, cycloalkyl having from 5 to 6 carbon atoms, phenyl, benzyl or α - or β - phenethyl and R^2 is hydrogen or lower alkyl, in a first inert organic solvent at a temperature ranging from 0°C to the boiling temperature of the solvent to give a solution of 1,3-oxazino(5,6-c)rifamycins of formula



(IV)

in which R^1 is as above defined, treating said solution with water and a second inert organic solvent immixible with water at a pH adjusted at a value from 4 to 6, then discharging the aqueous phase and treating the organic phase with a primary amine, hydrazine, mono-substituted hydrazine or asymmetric di-substituted hydrazine at a temperature from about 20°C to about 80°C under basic conditions, the derivatives (III) being finally isolated from the organic phase according usual techniques.

3,963,706

SULPHAMOYLPHENYL-IMIDAZOLIDINONES

Rolf Wilhelm Pfirrmann, Lucerne, Switzerland, assignor to Ed. Geistlich Sohne A.G. fur Chemische Industrie, Wolhusen, Switzerland

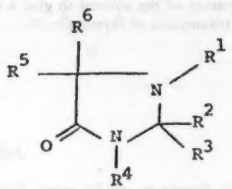
Filed Nov. 19, 1973, Ser. No. 416,854

Claims priority, application United Kingdom, Nov. 20, 1972, 53437/72

Int. Cl.[2] C07D *233/88*

U.S. Cl. 260—239.9 12 Claims

1. A compound of the formula



in which R^1 is phenyl; phenyl substituted with alkoxy, lower alkyl or halogen; or a cycloalkyl or cycloalkenyl group having 5–10 carbon atoms or a sulphamoylphenyl group, R^4 represents a sulphamoylphenyl or phenyl group; R^2 and R^3 each represent hydrogen atoms or an oxo group; and R^5 and R^6 are hydrogen atoms or lower alkyl or cycloalkyl groups; with the proviso that one of R^1 and R^4 , but not both is a sulphamoylphenyl group.

3,963,707

NOVEL N-NITROSO COMPOUNDS, COMPOSITIONS CONTAINING SUCH COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND METHODS OF TREATMENT THEREWITH, AND NOVEL INTERMEDIATES

Knut Bertil Högberg; Hans Jacob Fex, both of Helsingborg; Imre Konyves, Hittarp, and Anders Robert Stamvik, Helsingborg, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

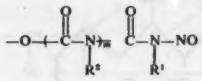
Filed Feb. 25, 1974, Ser. No. 445,572

Claims priority, application United Kingdom, Mar. 5, 1973, 10613/73

Int. Cl.[2] C07J *1/00*

U.S. Cl. 260—239.55 D 62 Claims

1. Novel compounds having the general formula ti AR_m (I)



wherein R is where R^1 is a β- or γ-halogen substituted alkyl group having 2 to 4 carbon atoms, inclusive; where the halogen of R^1 is selected from the group consisting of fluorine, chlorine and bromine; where m is an integer selected from the group consisting of zero and one; where R^2, when m is one, is selected from the group consisting of R^1, hydrogen, lower alkyl, 5- to 6-membered cycloalkyl, 5- to 6-membered cycloalkyl substituted with one or two substituents selected from the group consisting of halogen, lower alkyl and lower alkoxy, phenyl and phenyl substituted with one or two substituents selected from the group consisting of halogen, lower alkyl and lower alkoxy;

wherein n is one or two; and

wherein A is the radical of a steriod having a cyclopentanophenanthrene carbon-carbon skeleton containing up to a maximum of 40 carbon atoms, inclusive of substituents, said carbon-carbon skeleton including a nucleus selected from the group consisting of saturated and unsaturated gonane nuclei having up to a maximum of four double bonds, said steroid radical being attached to R in at least one and not more than two of the 3-, 11-, 16-, 17- and 21-positions thereof, said positions being identified according to steriod nomenclature.

3,963,708

BIS-AZOMETHINE METAL COMPLEX COLORANTS FROM HYDROXYCOUMARIN DERIVATIVES OR HYDROXYCHROMONE DERIVATIVES

Francois L'Eplattenier; Laurent Vuitel, both of Therwill, and Andre Pugin, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

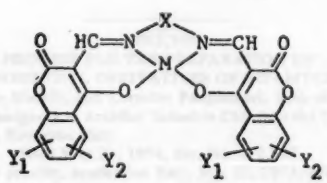
Filed July 28, 1975, Ser. No. 599,445

Claims priority, application Switzerland, July 31, 1974, 10584/74

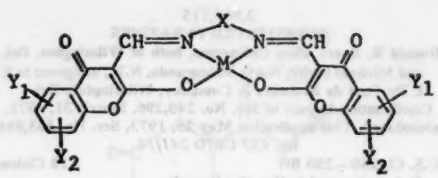
Int. Cl.[2] C07D *493/04*

U.S. Cl. 260—240 G 10 Claims

1. Bis-azomethine metal complex colorants of the formulae



or



wherein M denotes a divalent transition metal cation, zinc ion or cadmium ion, X denotes an isocyclic or heterocyclic aromatic radical to which the two nitrogen atoms are bonded in the o- or peri-position to one another and Y_1 and Y_2 denote hydrogen, halogen, alkyl, aryl, nitro, alkoxy, phenoxy or hydroxyl.

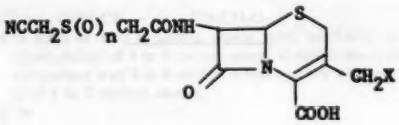
3,963,709

CYANOMETHYL SULFINYL- AND SULFONYL-ACETAMIDO CEPHALOSPORINS

Robert M. DeMarinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 389,407, Aug. 17, 1973, Pat. No. 3,883,520. This application Feb. 11, 1975, Ser. No. 548,950
Int. Cl.² C07D 501/28
U.S. Cl. 260—243 C 7 Claims

1. A compound of the formula



where
n is 1, or 2; and
X is OCH_3, or SCH_3
or a non-toxic pharmaceutically acceptable salt thereof.

3,963,710

FINELY DIVIDED BLOCKED ISOCYANATES PREPARED IN THE PRESENCE OF SURFACTANTS

Carl Albert Aufdermarsh, Jr., Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 28, 1974, Ser. No. 501,456
Int. Cl.² C07D 295/00
U.S. Cl. 260—247.2 A 11 Claims

1. A process for the preparation of finely divided blocked isocyanates consisting of reacting a polyisocyanate and an active hydrogen-containing compound, or mixture of compounds, selected from the group consisting of a primary alcohol, a secondary alcohol, a secondary amine, and a phenolic compound in solution in the presence of a surfactant, whereupon the product precipitates in exceptionally finely divided form.

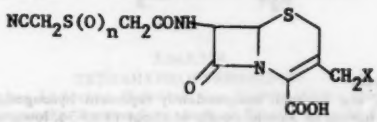
3,963,711

CYANOMETHYL SULFINYL- AND SULFONYL-ACETAMIDO CEPHALOSPORINS

Robert M. DeMarinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 389,407, Aug. 17, 1973, Pat. No. 3,883,520. This application Feb. 11, 1975, Ser. No. 548,951
Int. Cl.² C07D 501/28
U.S. Cl. 260—243 C 7 Claims

1. A compound of the formula



where
n is 1, or 2; and
X is hydrogen, or acetoxy
or a non-toxic pharmaceutically acceptable salt thereof.

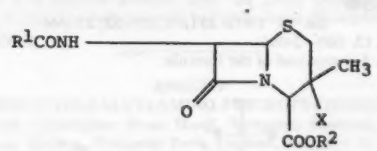
3,963,712

3-HALO-CEPHALOSPORINS

Masao Koyama, and Shigeo Seki, both of Tokyo, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Apr. 11, 1973, Ser. No. 350,199
Claims priority, application Japan, Apr. 14, 1972, 47-36850
Int. Cl.² C07D 501/14
U.S. Cl. 260—243 C 11 Claims

1. A compound of the formula:



wherein R^1 represents benzyl or phenoxymethyl, R^2 represents hydrogen, methyl, benzyl, p-nitrobenzyl or 2,2,2-trichloroethyl, and X is chlorine, bromine or iodine.

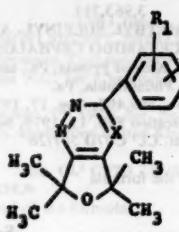
3,963,713

FURO(3,4-e)-AS-TRIAZINES AND CORRESPONDING 4-OXIDES

Gregory B. Bennett, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 541,721, Jan. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,578, Aug. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 465,759, May 1, 1974, abandoned. This application June 12, 1975, Ser. No. 586,349
Int. Cl.² C07D 253/08
U.S. Cl. 260—248 AS 16 Claims

1. A compound of the formula



wherein

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, straight chain lower alkoxy, amino, nitro or trifluoromethyl, and

X represents $\overset{\diagup}{\underset{\diagdown}{=}}$N or $\overset{\diagup}{\underset{\diagdown}{=}}$N → O

provided that

i. when one of R_1 and R_2 represents nitro, the other is other than nitro or trifluoromethyl;

ii. when R_1 and R_2 represent trifluoromethyl, they are on other than adjacent carbon atoms, and

iii. when R_1 and R_2 represent t-butyl, they are on other than adjacent carbon atoms,

iv. when one of R_1 and R_2 is trifluoromethyl and the other is t-butyl, they are on other than adjacent carbon atoms.

3,963,714

QUATERNARY AMMONIUM SALTS

Jozsef Gerendas, Neustadt; Herbert Fleischer, Beindersheim; Rolf Fikentscher, Ludwigshafen, all of Germany, and Herbert Helfert, Trenton, Mich., assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

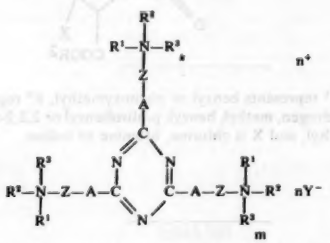
Filed Dec. 6, 1974, Ser. No. 530,305

Claims priority, application Germany, Dec. 13, 1973, 2361949

Int. Cl.² C07D *251/70, 251/52, 251/46*

U.S. Cl. 260—249.6 **11 Claims**

1. A compound of the formula:



(I)

wherein A is an oxygen atom or a group of the formula RN< in which R is hydrogen or alkyl of 1 to 4 carbon atoms, R^1, R^2 and R^3 are, each independently straight-chain or branched optionally hydroxysubstituted alkyl of 1 to 30 carbon atoms optionally interrupted by oxygen or nitrogen or benzyl or chlorobenzyl or R^1 and R^2 together form alkylene of 4 to 6 carbon atoms, *k* and *m* are, each independently, zero or 1, Z is optionally hydroxy- or methyl-substituted alkylene of 2 to 6 carbon atoms optionally interrupted by oxygen, Y^- is a monovalent organic or inorganic anion or is the *x*-th part of a x-valent organic or inorganic anion, *n* equals the sum of $1 + k + m$, provided that the total number of carbon atoms in R^1, R^2 and R^3 is from 9 to 60 and the total number of carbon atoms in R^1, R^2 and R^3 of at least one ammonium group is not less than 5.

3,963,715

SUBSTITUTED PYRAZINES

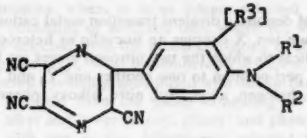
Donald R. Baer; Allan Cairncross, both of Wilmington, Del., and Michael Smith, North Tonawanda, N.Y., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 240,296, March 31, 1972, abandoned. This application May 25, 1973, Ser. No. 363,804

Int. Cl.² C07D *241/14*

U.S. Cl. 260—250 BN **10 Claims**

1. A compound having the formula



wherein:

R^1 and R^2, alike or different, are:

alkyl of 1-12 carbon atoms, cycloalkyl of 3-7 carbons, phenyl, p-chlorophenyl, or p-bromophenyl;

p-(lower alkyl)phenyl, p-(lower alkoxy)phenyl, or p-(lower alkylthio)phenyl, any lower alkyl being of up to 6 carbons; or

aralkyl, aroxyalkyl, aroyloxyalkyl, alkanoyloxyalkyl or trifluoroacetoxyalkyl of up to 15 carbons with the provisos that (1) any aryl moiety in any of these five groups is phenyl substituted with up to two alkyl groups of up to six carbons each and that (2) the alkylene group of aroyloxyalkyl, alkanoyloxyalkyl or trifluoroacetoxyalkyl is of at least 2 carbons in length.

3,963,716

NOVEL 1-PHTHALAZONE DERIVATIVE, A PROCESS FOR ITS PREPARATION AND A PHARMACEUTICAL COMPOSITION CONTAINING IT

Michiro Inoue, 6-26-3, Kokuryo, Chofu, Tokyo; Masayuki Ishikawa, 3-14-13, Akatsutsumi, Setagaya, Tokyo; Takashi Tsuchiya, 5-17-25, Minamikoiwa, Edogawa, Tokyo, and Takio Shimamoto, 13, Kitamachi, Shinjuku, Tokyo, all of Japan

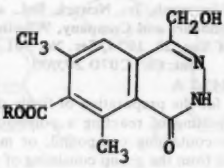
Filed Sept. 10, 1974, Ser. No. 504,745

Claims priority, application Japan, Oct. 30, 1973, 48-121260; Oct. 31, 1973, 48-121757

Int. Cl.² C07D *237/32, 491/04*

U.S. Cl. 260—250 P **3 Claims**

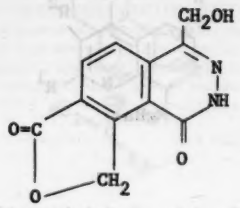
1. A compound of the formula:



(I)

wherein R is a member selected from the group consisting of alkyl of from 1 to 5 carbon atoms.

3. A compound of the formula:



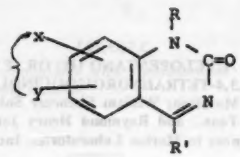
3,963,717

TRICYCLIC FURO-QUINAZOLINONES

George A. Cooke, Denville, and William J. Houlihan, Mount Lakes, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 10, 1975, Ser. No. 556,574
Int. Cl.² C07D 491/04
U.S. Cl. 260—251 QB 88 Claims

1. A compound of the formula:

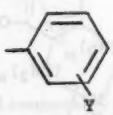


wherein

$\widehat{xy}$ is $-OCH_2CH_2-$ or $-CH_2CH_2O-$,

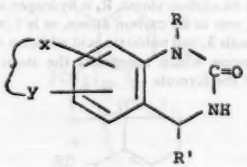
R is alkyl of 1 to 6 carbon atoms, allyl, methallyl or cycloalkylalkyl of 4 to 8 carbon atoms in which the cycloalkyl portion is of 3 to 6 carbon atoms and the alkyl portion is of 1 to 2 carbon atoms,

R' is



Y is hydrogen, fluoro, chloro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or trifluoromethyl.

73. A compound of the formula:



wherein

$\widehat{xy}$ is $-OCH_2CH_2-$ or $-CH_2CH_2O$,

R is alkyl of 1 to 6 carbon atoms, allyl, methallyl or cycloalkylalkyl of 4 to 8 carbon atoms in which the cycloalkyl portion is of 3 to 6 carbon atoms and the alkyl portion is of 1 to 2 carbon atoms,

R' is

and

Y is hydrogen, fluoro, chloro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or trifluoromethyl.

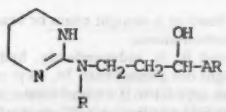
3,963,718

TETRAHYDROPYRIMIDINES

Josephus Ludovicus Hubertus Van Gelder; Alfons Herman Margaretha Raeymaekers, both of Beerse; Leopold Frans Cornell Roevens, Rijkevorsel, and Willy Joannes Van Laerhoven, Ravels, all of Belgium, assignors to Janssen Pharmaceutica, Beerse, Belgium

Division of Ser. No. 499,743, Aug. 13, 1974, Pat. No. 3,925,383, which is a division of Ser. No. 313,285, Dec. 8, 1972, Pat. No. 3,865,834. This application Apr. 16, 1975, Ser. No. 568,744
Int. Cl.² C07D 239/14
U.S. Cl. 260—256.4 H 2 Claims

1. A chemical compound having the formula:



wherein:

R is a member selected from the group consisting of hydrogen and benzyl; and

Ar is a member selected from the group consisting of phenyl, loweralkylphenyl, halophenyl and dihalophenyl.

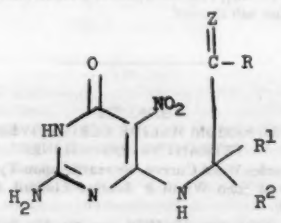
3,963,719

6-SPIROCYCLOALKYLAMINO 5-NITROPYRIMIDINES

Hamish Christopher Swan Wood, Bearsden, Scotland, and Irene Stirling, Worcester Park, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed July 30, 1973, Ser. No. 383,698
Claims priority, application United Kingdom, Aug. 1, 1972, 35814/72
Int. Cl.² C07D 239/22
U.S. Cl. 260—256.4 C 2 Claims

1. A compound of the formula, or a tautomeric form thereof



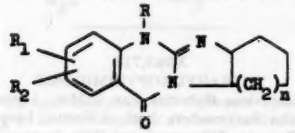
wherein Z is oxygen or a protecting group therefore, R is lower alkyl or hydroxylower alkyl, and R^1 and R^2, having in total 4 to 6 carbon atoms, form a spirocycloalkyl group together with the carbon atom substituted by said R^1 and R^2.

3,963,720
TETRACYCLIC IMIDAZO [2,1-b] QUINAZOLINONE DERIVATIVES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

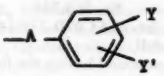
Continuation-in-part of Ser. No. 301,648, Oct. 27, 1972. This application June 21, 1974, Ser. No. 481,698
Int. Cl.² C07D *471/04*, *487/04*
U.S. Cl. 260—256.4 F 18 Claims

1. A compound of the formula:



wherein

R is alkyl of 1 to 8 carbon atoms, alkenyl of 3 to 10 carbon atoms, alkynyl of 3 to 6 carbon atoms or



n is 0 or 1,

A is a direct bond or a straight chain or branched alkylene of 1 to 3 carbon atoms;

each of R_1 and R_2 is, independently, hydrogen, halo of atomic weight not greater than 36, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo or trifluoromethyl, and

each of Y and Y' is, independently, hydrogen, halo of atomic weight not greater than 36, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo or trifluoromethyl,

or a pharmaceutically acceptable acid addition salt thereof.

3,963,721
2-(PIPERAZINOETHYL)-6,7-DIHYDROINDOLO)[1,7-ab] [1]BENZAZEPINE

Ernest John Alexander, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 475,455, June 3, 1974. This application June 19, 1975, Ser. No. 588,416
Int. Cl.² C07D *403/14*
U.S. Cl. 260—268 PC 3 Claims

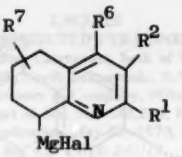
1. 2-[(4-Phenyl-1-piperazinyl)ethyl]-1-methyl-6,7-dihydroindolo[1,7-ab][1]benzazepine or a medicinally acceptable acid-addition salt thereof.

3,963,722
MAGNESIUM HALIDE DERIVATIVES OF TETRAHYDROQUINOLINES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Nov. 22, 1974, Ser. No. 526,353
Claims priority, application United Kingdom, Nov. 26, 1973, 54728/73; Mar. 27, 1974, 13516/74
Int. Cl.² C07D *215/16*; C07F *3/02*
U.S. Cl. 260—283 R 4 Claims

1. A compound of formula (II)



wherein

R^1, R^2 and R^6 are independently hydrogen, trifluoromethyl, alkyl of 1 to 6 carbon atoms, phenylalkyl of 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, halophenyl, nitrophenyl or trifluoromethylphenyl;

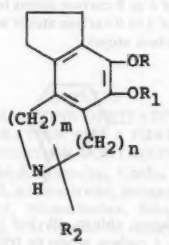
R^7 is hydrogen, alkyl of 1 to 6 carbon atoms, gem-dimethyl (at the 5, 6 or 7 position), phenylalkyl of 7 to 12 carbon atoms, and Hal represents chlorine, bromine or iodine, with the proviso that when R^1 and R^2 and R^6 are both alkyl they are selected from normal and secondary alkyl groups.

3,963,723
CYCLOPENTANO (H) OR (F) 1,2,3,4-TETRAHYDROISOQUINOLINES

Ian William Mathison; William Ebenezer Solomons, both of Memphis, Tenn., and Raymond Henry Jones, Northport, N.Y., assignors to Marion Laboratories, Inc., Kansas City, Mo.

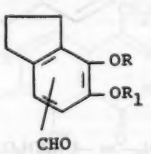
Filed Mar. 28, 1974, Ser. No. 455,574
Int. Cl.² C07D *217/00*
U.S. Cl. 260—286 R 9 Claims

1. A compound of the formula

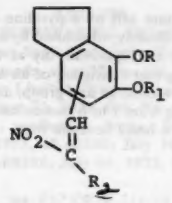


wherein R and R_1 are the same or different lower alkyl groups having one to six carbon atoms, R_2 is hydrogen or a lower alkyl group having one to six carbon atoms, *m* is 1 or 2, *n* is 1 or 2 and $m+n$ equals 3, and nontoxic acid addition salts thereof.

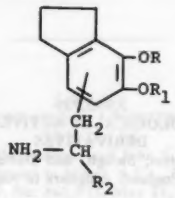
6. The process which comprises the steps of reacting a compound of the formula



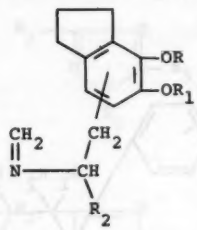
with a compound of the formula $R_2CH_2NO_2$ in glacial acetic acid in the presence of ammonium acetate to produce a compound of the formula



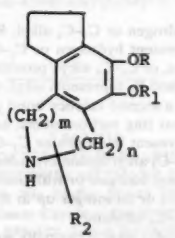
reacting said compound with lithium aluminum hydride to produce a compound of the formula



reacting said compound with formaldehyde to produce a compound of the formula



and then cyclizing said compound by reacting the compound with hydrochloric acid to produce a compound of the formula



wherein R and R_1 are the same or different alkyl groups having one to six carbon atoms, R_2 is hydrogen or a alkyl group having one to six carbon atoms, *m* is 1 or 2, *n* is 1 or 2 and *m* + *n* equals 3, and if desired converting said compound to an acid addition salt.

3,963,724

INTERMEDIATES USEFUL IN THE PREPARATION OF ARYLDECAHYDROPYRROLO[3,4-F]QUINOLINES

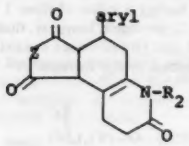
Frederic Peter Hauck, Somerville, and Joseph E. Sundeen, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 374,593, June 28, 1973, Pat. No. 3,891,652. This application Feb. 13, 1975, Ser. No. 549,581

Int. Cl.[2] C07D *491/04, 471/04*

U.S. Cl. 260—287 CF **7 Claims**

1. A compound of the formula:



wherein Z is

or —O—; R_1 and R_2 are lower alkyl; and aryl is phenyl or p-methoxyphenyl.

3,963,725

1,2,3,4-TETRAHYDROISOQUINOLINE DERIVATIVES AND THE PREPARATION THEREOF

Teiji Kishimoto, Kawanishi, and Yoshiyuki Kaneda, Osaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

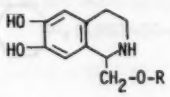
Filed July 19, 1974, Ser. No. 490,019

Claims priority, application Japan, July 20, 1973, 48-82003; July 20, 1973, 48-82004

Int. Cl.[2] C07D *217/16*

U.S. Cl. 260—289 D **3 Claims**

1. A 1,2,3,4-tetrahydroisoquinoline having the formula:



wherein R is phenyl having a lower alkylthio substituent, and pharmaceutically acceptable salts thereof, wherein "lower" refers to 1–6 carbon atom(s).

3,963,726

QUATERNARY AMMONIUM SALTS OF CHLOROMETHYLATED SILICON COMPOUNDS

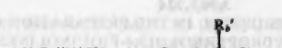
Enrico James Pepe, Amawalk, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 803,973, March 3, 1969, Pat. No. 3,661,963, which is a continuation-in-part of Ser. No. 423,414, Dec. 31, 1964, abandoned. This application Nov. 9, 1971, Ser. No. 197,112

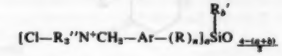
Int. Cl.[2] C07D *213/20, 215/10*

U.S. Cl. 260—290 S **11 Claims**

1. A quaternary ammonium salt selected from the group consisting of (A) silanes represented by the formula



wherein Ar is a phenylene radical, R is an alkylene radical having from 1 to 8 carbon atoms; R′ is an alkyl radical having from 1 to 20 carbon atoms, X is a radical selected from the group consisting of chlorine, fluorine and OR′ wherein R′ is as defined above; $R_3''N$ taken collectively represents a heterocyclic tertiary amine containing from 3 to 13 carbon atoms wherein the amino nitrogen represented by N is the nitrogen atom in said heterocyclic radical; *n* has a value of from 0 to 1; *a* is an integer having a value of from 1 to 3; and *b* has a value of from 0 to 2, provided, however, that the sum of (*a*+*b*) does not exceed 3; and (B) siloxanes consisting of at least one siloxy unit represented by the formula



wherein Ar, R, R′, $R_3''N$, *n*, *a*, *b*, and (*a*+*b*) are the same as defined above; and at least one siloxy unit represented by the formula

wherein R′ is the same as defined above and *m* is an integer from 1 to 3.

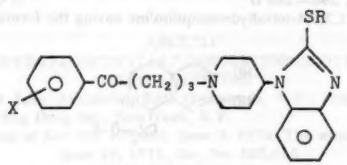
3,963,727

1,2 DISUBSTITUTED BENZIMIDAZOLE DERIVATIVES

Katsujiro Ueno; Makoto Sato; Masahiro Arimoto; Hiroshi Kojima; Terukiyo Yamasaki, and Takeo Sakurai, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed June 6, 1975, Ser. No. 584,347
Int. Cl.² C07D *401/04*
U.S. Cl. 260—293.6 3 Claims

1. A compound having the formula:



wherein R represents a hydrogen atom or a lower alkyl group and X represents a halogen atom; or the acid-addition salts thereof.

3,963,728

METHOD FOR PREPARING ACYLATED PRODUCTS

Yasuo Fujimoto, and Nobuhiro Nakamizo, both of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 49,918, June 25, 1970, Pat. No. 3,867,424.
This application Aug. 16, 1974, Ser. No. 498,125
Claims priority, application Japan, June 30, 1969, 44-51061
Int. Cl.² C07D *295/18*
U.S. Cl. 260—293.74 11 Claims

1. In a process for preparing a carboxylic acid amide which comprises acylating a heterocyclic amine with an ester derived from an aliphatic or aromatic carboxylic acid, the improvement which comprises carrying out said acylation in the presence of an alkali-metal salt, an alkaline earth metal salt or a quaternary ammonium salt of a pyridine compound whose pyridine nucleus is directly substituted by a hydroxy group or a mercapto group, and optionally by at least one member selected from the group consisting of an alkyl group having from 1 to 6 carbon atoms, an aryl group, an aralkyl group, an alkoxy group having from 1 to 6 carbon atoms, a nitro group, a cyano group and a fused benzene ring.

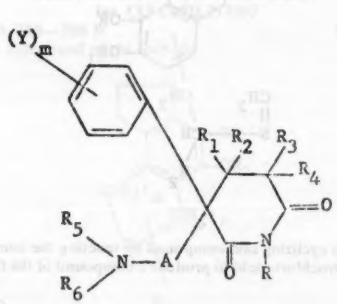
3,963,729

PHARMACOLOGICALLY ACTIVE PYRIDINE DERIVATIVES

Maurice Ward Gittos, Slough, and David Anthony Amey, Luton, both of England, assignors to Aspro-Nicholas Limited, England

Filed Dec. 18, 1973, Ser. No. 425,876
Claims priority, application United Kingdom, Dec. 28, 1972, 59761/72
Int. Cl.² C07D *295/00*
U.S. Cl. 260—293.86 3 Claims

1. Compounds having the formula



wherein

R represents hydrogen or C_1–C_4 alkyl, R_1, R_2 and R_3 independently represent hydrogen or C_1–C_4 alkyl, R_4 represents hydrogen, or C_1–C_4 alkyl, provided that at least one of R_1, R_2, R_3, and R_4 represents alkyl, or R_1 together with R_3 represents a second valency bond joining their immediately adjacent ring carbon atoms, and R_2 and R_4 independently represent hydrogen or C_1–C_4 alkyl;

Y represents C_1–C_4 alkyl optionally substituted by hydroxy, or C_1–C_4 alkoxy, halogen or trifluoromethyl;

m represents zero or an integer up to 5;

A represents C_1–C_8 alkylene;

R_5 represents C_1–C_4 alkyl, optionally substituted by C_3–C_6 cycloalkyl, or C_3–C_6 cycloalkyl and R_6 represents hydrogen or C_1–C_4 alkyl or R_5 together with R_6 represents an alkylene radical optionally interupted by oxygen or nitrogen and which together with the amino nitrogen atom constitute a saturated five or six membered heterocyclic ring, and pharmaceutically acceptable acid addition salts and quaternary amine salts thereof.

3,963,730

PROCESS FOR PREPARING TRIACETONAMINE

Keisuke Murayama; Syoji Morimura; Takao Yoshioka, and Tomoyuki Kurumada, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed June 21, 1974, Ser. No. 481,839

Claims priority, application Japan, June 26, 1973, 48-72014; July 16, 1973, 48-80200; July 16, 1973, 48-80201; July 16, 1973, 48-80202; July 16, 1973, 48-80203; May 30, 1974, 49-61148

Int. Cl.² C07D 211/74

U.S. Cl. 260—293.89 44 Claims

1. A process for preparing triacetonamine, comprising reacting acetonine with a compound selected from the group consisting of acetone, diacetone alcohol and combinations thereof in the presence of at least 12.5 mol -% based on acetonine of an acid catalyst under anhydrous conditions.

3,963,731

PYRIDYL CONTAINING 1-BENZENESULFONYL TRIAZOLES

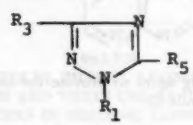
Frederick C. Novello, Berwyn, and John J. Baldwin, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 361,915, May 21, 1973, Pat. No. 3,892,762, which is a continuation-in-part of Ser. No. 75,784, Sept. 25, 1970, abandoned. This application Feb. 6, 1975, Ser. No. 547,847

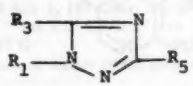
Int. Cl.² C07D 249/08

U.S. Cl. 260—294.8 F 3 Claims

1. A compound of the formula:



or



wherein R_1 is benzenesulfonyl;

R_3 is phenyl, lower alkylphenyl, tri-lower alkylphenyl, pyridyl, mono-lower alkylpyridyl or di-lower alkylpyridyl; and

R_5 is pyridyl, mono-lower alkylpyridyl or di-lower alkylpyridyl.

3,963,732

PROCESS FOR PREPARING DIHYDROXYDIPHENYLMETHANE DERIVATIVES

Tiberio Bruzzese, 8, Via Biella, 20143 Milan, and Rodolfo Ferrari, 7, Via Monte Cervino, 20149 Milan, both of Italy

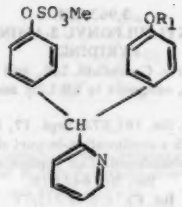
Division of Ser. No. 375,477, July 2, 1973, Pat. No. 3,878,218. This application Aug. 21, 1974, Ser. No. 499,433

Claims priority, application United Kingdom, May 30, 1973, 25633/73

Int. Cl.² C07D 213/30, 213/32

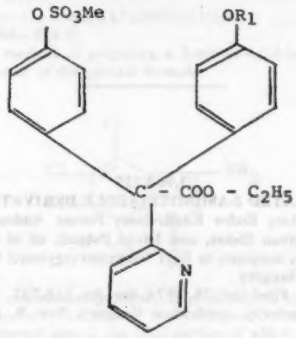
U.S. Cl. 260—294.8 R 6 Claims

1. A process for the preparation of an ester of the formula



(I)

in which R_1 is a hydrogen atom or a suphoxy group or is alkanoyl having up to 6 carbon atoms and Me is a pharmaceutically acceptable inorganic or organic non-toxic cation, wherein a compound of the formula



(II)

in which Me and R_1 have the same meaning as above, is selectively hydrolyzed and then decarboxylated, in a basic medium to produce the objective compound I wherein R_1 is hydrogen or a sulphoxy group and, when desired, acylating said compound with an organic acid to produce a compound I wherein R_1 is alkanoyl having up to 6 carbon atoms.

3,963,733

3-(P-METHOXYBENZYLTHIO)2-NON-OXOCARBONYLIC PYRIDINES

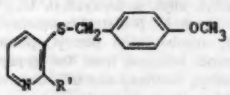
Benjamin Blank, Trevose, and John G. Gleason, Cornwell Heights, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 363,237, May 23, 1973, Pat. No. 3,873,552. This application Dec. 5, 1974, Ser. No. 529,785

Int. Cl.² C07D 213/79, 213/81

U.S. Cl. 260—294.8 G 1 Claim

1. A compound of the formula:



in which R' is carboxy, COO-lower alkyl or $CONH_2$.

3,963,734
LOWER ALKYLSULFONYL 2-AMINO, 3-NITRO PYRIDINES

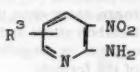
George O. P. Doherty, Greenfield, Ind., and Kenneth H. Fuhr, Columbus, Ohio, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 181,574, Sept. 17, 1971, Pat. No. 3,813,408, which is a continuation-in-part of Ser. No. 21,535, March 20, 1970, abandoned. This application Feb. 15, 1974, Ser. No. 443,075

Int. Cl.² C07D *213/71*

U.S. Cl. 260—294.8 F 5 Claims

1. A compound selected from the group consisting of the compounds of the formula



wherein R^3 represents loweralkylsulfonyl of C_1–C_4.

3,963,735
ACYLATED 2-AMINOTHIAZOLE DERIVATIVES

Lajos Farkas; Endre Kasztreiner; Ferenc Andrasi; Jozsef Borsi; Istvan Elekes, and Istvan Polgari, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

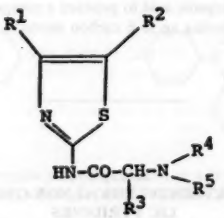
Filed Oct. 29, 1974, Ser. No. 518,732

Claims priority, application Hungary, Nov. 9, 1973, GO 1250

Int. Cl.² C07D *213/56*

U.S. Cl. 260—294.8 D 2 Claims

1. An acylated 2-aminothiazole derivative selected from the group consisting of a compound of the formula



in which

R^1 is pyridyl,

R^2 is a member selected from the group consisting of hydrogen and lower alkyl,

R^3 is a member selected from the group consisting of hydrogen, methyl and ethyl,

R^4 is hydrogen,

R^5 is a member selected from the group consisting of hydrogen, C_{1-6} alkyl, allyl, hydroxyalkyl, C_{3-6} cycloalkyl, β-dimethylaminoethyl, β-diethylaminoethyl, benzyl, 2-furylmethyl, unsubstituted phenyl, phenyl substituted with a member selected from the group consisting of halogen, methyl, methoxy and trifluoromethyl, or

both R^4 and R^5 are hydroxyalkyl,

and a pharmaceutically acceptable acid addition salt thereof.

3,963,736
PREPARATION OF 1-(LOWER ALKYL)-1,4-DIHYDRO-7-METHYL-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACIDS

Takenari Nakagome, Toyonaka; Hideo Agui, Minoo; Toru Mitani, Nishinomiya, and Mitsuo Nakashita, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

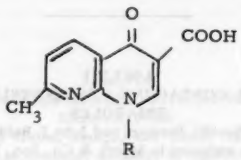
Division of Ser. No. 110,586, Jan. 18, 1971, Pat. No. 3,849,421. This application June 10, 1974, Ser. No. 478,118

Claims priority, application Japan, Jan. 28, 1970, 45-7895; Feb. 18, 1970, 45-14355; Feb. 23, 1970, 45-15721; Feb. 24, 1970, 45-16004; Feb. 24, 1970, 45-16005

Int. Cl.² C07D *471/04*

U.S. Cl. 260—295.5 B 11 Claims

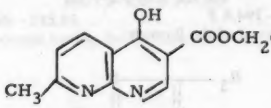
1. A process for the production of a 1,4-dihydro-7-methyl-4-oxo-1,8-naphthyridine-3-carboxylic acid represented by the formula I



(I)

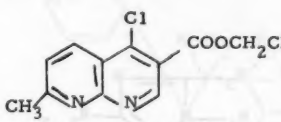
wherein R is a C_1–C_4 alkyl group, which process comprises

a. reacting the compound represented by the formula II



(II)

with a halogenating agent to provide the compound represented by the formula III



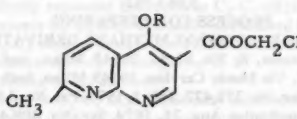
(III)

b. reacting the compound III so formed in the presence of a base selected from the group consisting of an alkali metal hydroxide, an alkali metal carbonate, a metal salt of an alcohol represented by the formula ROH

wherein R is as described above and pyridine with an alcohol represented by the formula

ROH

wherein R is as described above, to provide a compound represented by the formula IV

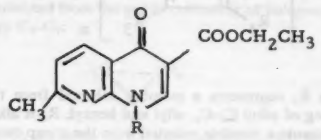


(IV)

wherein R is as described above:

c. heating the compound IV in the presence of absence of an alkylating agent or an acid to provide a compound represented by the formula V, wherein said alkylating agent is an alkyl halide, an alkenyl halide, an alkyl p-tol-

uene sulfonate, a cycloalkyl halide, an hydroxy alkyl halide, a dialkyl sulfate or triethyloxonium fluoroborate and wherein said acid is a strong, non-oxidizing inorganic or organic acid or a Lewis acid



(V)

and

d. then hydrolyzing the compound V to provide a 1,4-dihydro-7-methyl-4-oxo-1,8-naphthyridine-3-caboxylic acid represented by the formula I.

3,963,737

1,3-DIHYDROCARBYL-PYRAZOLE COMPOUNDS AS STABILIZERS FOR ORGANIC MATERIALS

Lajos Ávár, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed July 2, 1975, Ser. No. 592,369

Claims priority, application Switzerland, July 9, 1974, 9418/74

Int. Cl.² C07F 15/04; C08K 5/33

U.S. Cl. 260—299 **8 Claims**

1. A 1,3-dihydrocarbyl-pyrazole compound, having a 5-hydroxyl group in nickel salt form, characterized by a ketoxyimino group bound directly to the 4-position of the pyrazole ring through the ketoxyimino functional carbon atom.

3,963,738

BIS-OXADIAZOLYL PHENYL AROMATIC DIESTER COMPOUNDS AND THEIR USE AS ULTRAVIOLET STABILIZERS IN ORGANIC COMPOSITIONS

Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 1, 1974, Ser. No. 484,843

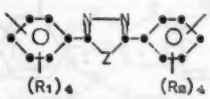
Int. Cl.² C07D 271/10

U.S. Cl. 260—307 G **14 Claims**

1. A composition of matter of the formula:

wherein

A is a member having the structure

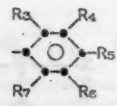


wherein

Z is an oxygen atom;

R_1 and R_2 are hydrogen, chloro, bromo, lower alkyl, and cyano and are present on all positions of the benzenoid rings, except the carbon atoms attached to the carboxyl group connecting the heterocyclic aromatic A group with the aromatic B group, said carboxyl connecting group is attached to the benzenoid ring in either the meta or para position from the carbon atom connected to the heterocyclic ring;

B is a group having the formula



wherein at least one R_3 or R_7 is hydrogen and the other R_3, R_4, R_5, R_6 and R_7 are hydrogen, lower alkyl, hydroxy, nitrile, chloro and bromo.

3,963,739

3-AMINO-4,5,6-TRICHLORO-7-NITRILOINDAZOLES

Klaus-Dieter Steffen, Troisdorf-Oberlar, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

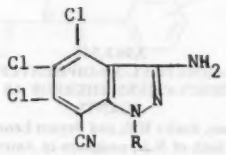
Continuation of Ser. No. 398,629, Sept. 19, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,950

Claims priority, application Germany, Sept. 30, 1972, 2248175

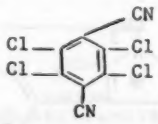
Int. Cl.² C07D 231/56

U.S. Cl. 260—310 C **3 Claims**

1. In a method of preparing a 3-amino-4,5,6-trichloro-7-nitriloindazole of the general formula



wherein R represents hydrogen, alkyl of from 1 to 6 carbon atoms, chloroalkyl of from 1 to 6 carbon atoms, phenyl or alkyl-substituted phenyl, the alkyl portion of which is an alkyl of from 1 to 6 carbon atoms by contacting a tetrachloroisophthalicaciddinitrile having the formula



with a hydrazine compound of the formula

H_2N-NHR

the improvement which comprises carrying out said process at a temperature between 10° and 50°C in the presence of a solvent for the reaction mixture, which solvent is selected from the group consisting of dioxane, methyl alcohol, ethyl alcohol, o-dichlorobenzene, ethyl ether and toluene and thereafter recovering a 3-amino-4,5,6-trichloro-7-nitriloindazole.

3,963,740

BENZO AND BENZOTHIOPYRANOINDAZOLE N-OXIDES

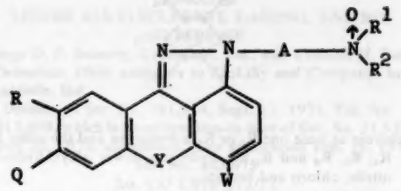
Edward Faith Elslager, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 379,779, July 16, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,634

Int. Cl.² C07D 231/56; A61K 31/415

U.S. Cl. 260—310 C **8 Claims**

1. A compound of the formula



and acid addition salts thereof; wherein:

A is an alkylene radical containing 2 to 4 carbon atoms;

R^1 and R^2 are the same or different and represent $C_1 - C_4$ alkyl;

W is methyl, hydroxymethyl or acyloxymethyl wherein said acyl fragment contains from one to eight carbon atoms,

Y is sulfur or oxygen; and

one of Q and R is hydrogen and the other is hydrogen, halo or alkoxy having from one to four carbon atoms.

3,963,741

4-ALKYL-1,2-DIMETHYL-3,5-DIPHENYLPYRAZOLIUM SALTS AND DERIVATIVES THEREOF AS FUNGICIDAL AGENTS

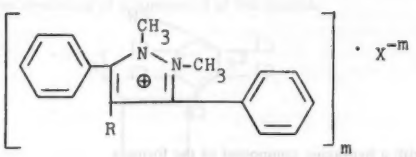
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 574,067, May 2, 1975. This application Oct. 2, 1975, Ser. No. 619,092

Int. Cl.² C07D 231/12; A01N 9/22

U.S. Cl. 260—311 **9 Claims**

1. A compound having the formula:



wherein R is a member selected from the group consisting of alkyl C_2–C_8, allyl, propargyl, benzyl and carbethoxymethyl; X represents an anion having a charge of from 1 to 3; and m represents an integer from 1 to 3.

3,963,742

1,2-DIALKYL-3,4,5-TRISUBSTITUTED PYRAZOLIUM SALTS AS HERBICIDAL AGENTS

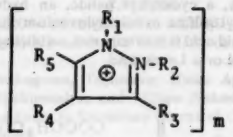
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 487,826, July 12, 1974, abandoned. This application June 6, 1975, Ser. No. 584,686

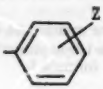
Int. Cl.² C07D 231/12; A01N 9/22

U.S. Cl. 260—311 **24 Claims**

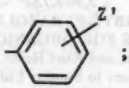
1. A compound having the formula:



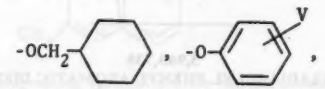
wherein R_1 represents a member selected from the group consisting of alkyl C_1–C_3, allyl and benzyl; R_2 is alkyl C_1–C_3; R_3 represents a member selected from the group consisting of

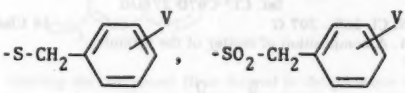


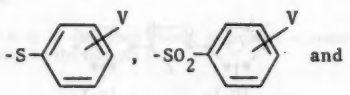
and naphthyl; R_5 is



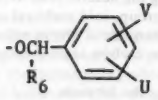
R_4 represents a member selected from the group consisting of alkoxy C_1–C_{22}, alkenyloxy C_3–C_4, halogen substituted alkenyloxy C_3–C_4, alkynyloxy C_3–C_4, —O—$(CH_2)_n$-W, alkylthio C_1–C_{22}, alkylsulfonyl C_1–C_{22},



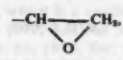




and



R_6 represents a member selected from the group consisting of hydrogen, methyl and phenyl; U and V each represent members selected from the group consisting of hydrogen, halogen, alkyl C_1–C_4, alkoxy C_1–C_4, NO_2 and CF_3; W represents a member selected from the group consisting of halogen, cyano, carbalkoxy C_1–C_7,



alkoxy C_1–C_7, alkylthio C_1–C_7, alkylsulfonyl C_1–C_7, benzylthio and benzylsulfonyl; Z and Z′ each represent members selected from the group consisting of hydrogen, halogen, alkyl C_1–C_{12}, alkoxy C_1–C_4 and phenyl; X is an anion with a charge of from 1 to 3; *m* represents an integer selected from 1, 2 and 3; and *n* represents an integer selected from 1, 2, 3 and 4.

3,963,743

METHOD OF CONDITIONING PHTHALOCYANINE PIGMENTS AND PRODUCT THEREOF

James Dial Stepp, Holland, Mich., assignor to Chemetron Corporation, Chicago, Ill.

Filed Oct. 1, 1973, Ser. No. 402,094
Int. Cl.² C09B 47/02
U.S. Cl. 260—314.5 **12 Claims**

1. A method of conditioning a phthalocyanine pigment selected from the class consisting of phthalocyanine, a metal phthalocyanine, a halogenated phthalocyanine and a halogenated metal phthalocyanine, said method consisting essentially of mixing the pigment with 4-sulfophthalic acid or anhydride at a temperature of from about 50° to about 100°C.

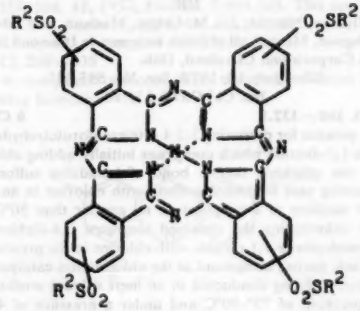
3,963,744

SILICONE-COMPATIBLE PHTHALOCYANINE DYESTUFFS

Carl Mayn Smith, Sun City, Ariz., and George V. D. Tiers, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 501,265, Aug. 28, 1974, abandoned, which is a division of Ser. No. 275,190, July 26, 1972, Pat. No. 3,888,891. This application Aug. 8, 1975, Ser. No. 604,651
Int. Cl.² C09B 47/02
U.S. Cl. 260—314.5 **1 Claim**

1. A metal phthalocyanine of the formula:



wherein M is a metal of the group of copper, nickel or cobalt and R^2 is tris(trimethylsilyloxy)silylalkylamino

straight or branched chain unsubstituted alkylene of 1–6 carbon atoms and R^1 is hydrogen or unsubstituted lower alkyl or 1 to 6 carbon atoms.

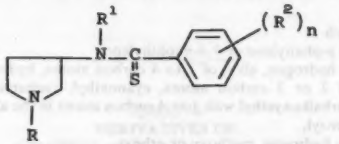
3,963,745

METHOD FOR CONTROLLING EMESIS WITH N-(1-SUBSTITUTED-3-PYRROLIDINYL)BENZAMIDES AND THIOBENZAMIDES

Albert Duncan Cale, Jr., Mechanicsville, and Charles Arthur Leonard, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 340,417, March 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 240,840, April 3, 1972, abandoned. This application Oct. 25, 1974, Ser. No. 518,124
Int. Cl.² C07D 207/14; A61K 31/40
U.S. Cl. 260—326.5 S **3 Claims**

1. A compound of the formula:



wherein;
R is cycloalkyl of four to 12 carbon atoms,
R^1 is hydrogen and lower alkyl of 1–8 carbon atoms,
R^2 is nitro, amino, halogen, sulfamoyl, methoxy and ethoxy,
n is an integer from zero to three inclusive, and the pharmaceutically acceptable acid addition salts thereof.

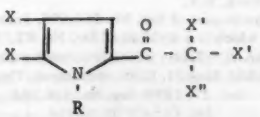
3,963,746

4,5 DIHALOPYRROL 2-YL DI AND TRI HALOMETHYL KETONES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 350,086, March 11, 1973, Pat. No. 3,918,954. This application Apr. 28, 1975, Ser. No. 572,430
Int. Cl.² C07D 207/36
U.S. Cl. 260—326.5 J **18 Claims**

1. A compound having the formula



wherein each X is chlorine, bromine, or iodine, both values of X being identical; X′ is chlorine or fluorine, both values of X′

being identical; X'' is either hydrogen or chlorine or fluorine identical with X'; and R is hydrogen or lower-alkyl.

3,963,747

BASIC ARYLMERCAPTONAPHTHOLACTAM DYES

Ernst Schefczik, Ludwigshafen, and Klaus Grychtol, Bad Duerkheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

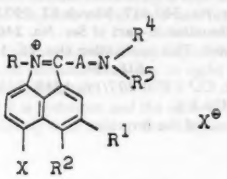
Filed May 30, 1974, Ser. No. 474,598

Claims priority, application Germany, June 2, 1973, 2328163

Int. Cl.² C07D 209/62

U.S. Cl. 260—326.27 5 Claims

1. A dye of the formula



in which

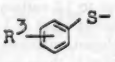
A is p-phenylene or 1,4-naphthylene,

R is hydrogen, alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 2 or 3 carbon atoms, cyanoethyl, carbamoylethyl, carbalkoxyethyl with 1 to 4 carbon atoms in the alkoxy or benzyl,

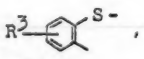
R^1 is hydrogen, methoxy or ethoxy,

R^2 is hydrogen or methoxy,

X is



X and R^3 together are



S being para to the nitrogen,

R^3 is hydrogen, chlorine, methyl, methoxy or ethoxy,

R^4 is alkyl of 1 to 4 carbon atoms, chloroalkyl of 2 or 3 carbon atoms, cyanoethyl, benzyl, phenylethyl, cyclohexyl, phenyl, methoxyphenyl or ethoxyphenyl,

R^5 is hydrogen, alkyl of 1 to 4 carbon atoms or chloroalkyl of 2 or 3 carbon atoms,

R^4 and R^5 together with the nitrogen are pyrrolidino, and

X^- is an anion.

3,963,748

1-PHENYL-3-AZACARBOCYCLIC-UREAS

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 266,695, June 27, 1972, abandoned, which is a division of Ser. No. 82,799, Oct. 21, 1970, Pat. No. 3,717,648, which is a continuation-in-part of Ser. No. 733,323, May 31, 1968, abandoned. This application Dec. 27, 1974, Ser. No. 536,755

Int. Cl.² C07D 207/14

U.S. Cl. 260—326.47 6 Claims

1. A compound selected from 1-(4-chlorophenyl)-3-(1-pyrrolin-2-yl)urea and 1-(4-bromophenyl)-3-(1-pyrrolin-2-yl) urea and pharmaceutically acceptable acid-addition salts thereof.

3,963,749

1-METHYL-2,3-DIHYDRO-1,4-DITHIINIUM METHOSULFATE

Klaus Naumann, Cologne; Klaus Lürssen, Groszkoenigsdorf, and Klaus Sasse, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 5, 1974, Ser. No. 476,765

Claims priority, application Germany, June 19, 1973, 2331186

Int. Cl.² C07D 339/08

U.S. Cl. 260—327 P 1 Claim

1. 1methyl-2,3-dihydro-1,4-dithiinium methosulfate.

3,963,750

THIOPHENE DERIVATIVES

Alexander Crossan Goudie, Harlow, England, assignor to Beecham Group Limited, Great Britain

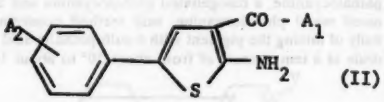
Filed July 23, 1974, Ser. No. 491,060

Claims priority, application United Kingdom, Aug. 9, 1973, 37699/73

Int. Cl.² C07D 333/24

U.S. Cl. 260—332.2 C 4 Claims

1. A compound of the formula (II):



(II)

or a pharmaceutically acceptable non-toxic salt thereof, wherein A_1 is NHA_3 wherein A_3 is hydrogen or alkyl of 1–6 carbon atoms; and A_2 is fluorine.

3,963,751

CHLORINATION OF BUTADIENE SULFONE TO 3,3,4,4-TETRACHLOROTETRAHYDROTHIOPHENE-1,1-DIOXIDE

Alex Hlynsky, Mentor; Jan M. Griggs, Madison, and Edmond R. Osgood, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed July 14, 1975, Ser. No. 595,531

Int. Cl.² C07D 333/48

U.S. Cl. 260—332.1 6 Claims

1. A process for preparing 3,3,4,4-tetrachlorotetrahydrothiophene-1,1-dioxide which comprises initially adding chlorine across the ethylenic double bond of butadiene sulfone by chlorinating said butadiene sulfone with chlorine in an inert solvent medium at a temperature no greater than 50°C; secondly chlorinating the obtained saturated 3,4-dichlorotetrahydrothiophene-1,1-dioxide with chlorine in the presence of an organic peroxy compound as the chlorination catalyst, said chlorination being conducted in an inert solvent medium, at a temperature of 75°–90°C and under a pressure of 40–60 psig, said organic peroxy compound being benzoyl peroxide or succinic acid peroxide; and finally recovering 3,3,4,4-tetrachlorotetrahydrothiophene-1,1-dioxide product in greater than 70% yield.

3,963,752

DISUBSTITUTED X^A NTHONE CARBOXYLIC ACID COMPOUNDS

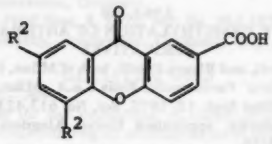
Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 431,794, Jan. 8, 1974, Pat. No. 3,894,049, which is a continuation-in-part of Ser. No. 259,852, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 217,287, Jan. 12, 1972, Pat. No. 3,849,565. This application Mar. 13, 1975, Ser. No. 558,024

Int. Cl.² C07D *311/86*

U.S. Cl. 260—335 14 Claims

1. A compound selected from those represented by the following formula:



and the pharmaceutically acceptable, non-toxic alkyl or glycerol esters, amides, and salts thereof;

wherein one R^2 group is selected from alkoxy containing from one to twelve carbon atoms and the other R^2 group is selected from the group

in which *n* is the integer 1 or 2, R is lower alkyl when *n* is 1 and R is lower alkyl, hydroxy, amino, monolower alkylamino, or dilower alkylamino when *n* is 2.

3,963,753

DISUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

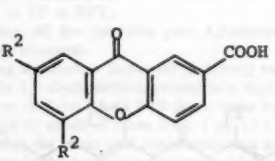
Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 431,794, Jan. 8, 1974, Pat. No. 3,894,049, which is a continuation-in-part of Ser. No. 259,852, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 217,287, Jan. 12, 1972, Pat. No. 3,849,565. This application Mar. 13, 1975, Ser. No. 558,023

Int. Cl.² C07D *311/86*

U.S. Cl. 260—335 7 Claims

1. A compound selected from those represented by the following formula:



and the pharmaceutically acceptable, non-toxic alkyl or glycerol esters, amides, and salts thereof;

wherein one R^2 group is alkoxy and the other R^2 group is lower alkanoyl.

3,963,754

2-VINYL-5-METHYL-1,3-DIOXANE

Charles C. Cumbo, Wilmington, and Kamlesh K. Bhatia, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 31, 1974, Ser. No. 493,741

Int. Cl.² C07D *319/06;* C07C *29/00*

U.S. Cl. 260—340.7 1 Claim

1. 2-vinyl-5-methyl-1,3-dioxane.

3,963,755

MIXTURE OF 2(2'-PROPANAL)-5-METHYL-1,3-DIOXANE AND 2(3'-PROPANAL)-5-METHYL-1,3-DIOXANE

Charles C. Cumbo, Wilmington, and Kamlesh K. Bhatia, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 31, 1974, Ser. No. 493,742

Int. Cl.² C07D *319/06;* C07C *29/00*

U.S. Cl. 260—340.7 1 Claim

1. The cyclic acetal-aldehyde mixture of 2(2'-propanal)-5-methyl-1,3-dioxane and 2(3'-propanal)-5-methyl-1,3-dioxane.

3,963,756

DERIVATIVES OF 6-METHYL-2H-PYRAN-2,4(3H)-DIONE

Masaji Ohno, and Mutsuo Kataoka, both of Kamakura, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

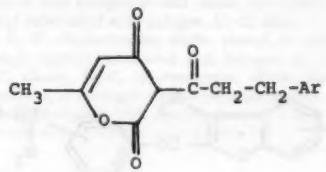
Filed May 24, 1973, Ser. No. 363,559

Claims priority, application Japan, May 24, 1972, 47-50776

Int. Cl.² C07D *309/30*

U.S. Cl. 260—343.5 17 Claims

1. A hypotensive compound selected from the group consisting of 6-methyl-2H-pyran-2,4-(3H)-diones of the formula:



wherein Ar is phenyl substituted by at least one member selected from the group consisting of halogen, hydroxyl, alkyl of 1–4 carbon atoms and alkoxy of 1–4 carbon atoms, provided that said substituted phenyl is not 3,4-dimethoxyphenyl, and the physiologically acceptable salts thereof.

3,963,757

PROCESS FOR THE PREPARATION OF LACTONES

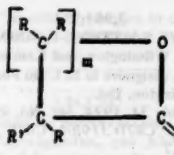
Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 888,867, Dec. 29, 1969, abandoned. This application Aug. 21, 1972, Ser. No. 282,253

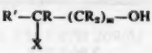
Int. Cl.² C07D *307/32, 309/30*

U.S. Cl. 260—343.6 12 Claims

1. A process for the preparation of a lactone represented by the formula



wherein a cyanide represented by the formula $M(CN)_n$ is reacted with a haloalkanol represented by the formula



in the presence of water and a phosphine promoter having the formula R''_3P in which formulae R′ is hydrogen, alkyl, cycloalkyl, aryl, alkaryl or aralkyl having from 1 to 8 carbon atoms per R′ group; R is hydrogen or alkyl having from 1 to 3 carbon atoms per R group, the total number of carbon atoms in all R groups per molecule is not greater than 6; R″ is alkyl, aryl, cycloalkyl, aralkyl or alkaryl having from 1 to 8 carbon atoms in each group; M is an alkali or alkaline earth metal, X is a halogen; n is 1 or 2 and m is 2 or 3.

3,963,758

2-(BENZOFUROYL)PHENYL ACETIC ACIDS

Henri Pinhas, Paris, and Monique Susini, Bretigny, both of France, assignors to Serdex - Societe d'Etudes, de Recherches, de Diffusion et d'Exploitation, Puteaux, France

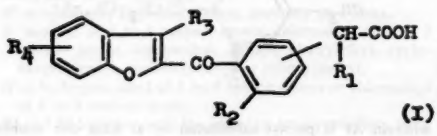
Filed June 14, 1974, Ser. No. 480,135

Claims priority, application United Kingdom, June 26, 1973, 30196/73

Int. Cl.² C07D *307/78*

U.S. Cl. 260—346.2 R **4 Claims**

1. A compound selected from the group consisting of a compound of the formula



(I)

in which

R_1 is selected from the group consisting of hydrogen and alkyl having 1–6 carbon atoms,

R_2 is selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms and halogen,

R_3 is selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, phenyl and

R_4 is selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, alkoxy having 1–6 carbon atoms, hydroxy, halogen and trifluoromethyl and their pharmacologically acceptable salts and lower alkanol esters.

3,963,759

OXIDATION OF MESITYL OXIDE TO CITRACONIC ANHYDRIDE

Edwin J. Strojny, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 7, 1973, Ser. No. 367,912

Int. Cl.² C07D *307/56*

U.S. Cl. 260—346.8 A **8 Claims**

1. The process of making citraconic anhydride comprising contacting a gaseous mixture of mesityl oxide and air or oxygen with a catalyst comprising vanadium oxide, a vanadate salt or a vanadyl salt at reaction temperature, said gaseous mixture containing at least about 10 moles of oxygen per mole of mesityl oxide.

3,963,760

SELECTIVE DEMETHYLATION OF ANTHRACYCLINE DERIVATIVES

Luigi Bernardi, and Bianca Patelli, both of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

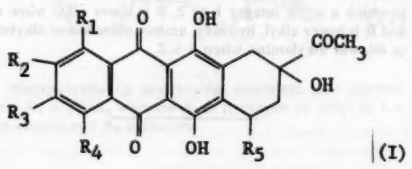
Filed Sept. 15, 1975, Ser. No. 613,423

Claims priority, application United Kingdom, Sept. 20, 1974, 41015/74

Int. Cl.² C07C *87/10*

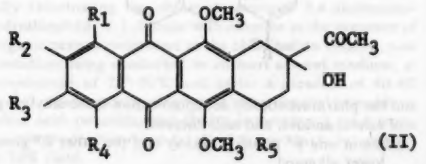
U.S. Cl. 260—365 **4 Claims**

1. A process for preparing an anthracycline derivative of the formula



(I)

wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, chlorine, bromine and methoxy group, with the proviso that at least one of R_1, R_2, R_3 and R_4 is methoxy; and wherein R_5 is selected from the group consisting of hydrogen, OH, OR and OCOR, in which R is an alkyl group of 1 to 4 carbon atoms; said process comprising reacting a compound of the formula



(II)

wherein R_1, R_2, R_3, R_4 and R_5 are as defined above with an aluminum halide in the presence of a solvent selected from the group consisting of chlorobenzene, bromobenzene, and nitrobenzene, at a temperature of from 0° to 50°C., and isolating the demethylated product from the reaction mixture.

3,963,761

PROCESS FOR THE PRODUCTION OF DINITRO-ANTHRAQUINONES

Axel Vogel, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 4, 1974, Ser. No. 503,197

Claims priority, application Germany, Sept. 14, 1973, 2346317

Int. Cl.² C07C 49/68

U.S. Cl. 260—369 11 Claims

1. Process for the production of dinitro-anthraquinones, which comprises nitrating an anthraquinone in the presence of from 0.4 to 25 by volume, per part by weight of the anthraquinone, of an inert inorganic solvent which is an aliphatic or alicyclic hydrocarbon having up to 12 carbon atoms and substituted once or several times by halogen or by the nitro group.

3,963,762

PROCESS FOR PRODUCING 1,5-DINITROANTHRAQUINONE AND 1,8-DINITROANTHRAQUINONE

Walter Hohmann, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 10, 1974, Ser. No. 513,907

Claims priority, application Germany, Oct. 13, 1973, 2351590; Aug. 16, 1974, 2439280

Int. Cl.² C07C 49/68

U.S. Cl. 260—369 16 Claims

1. Process for recovering substantially pure 1,5-and/or 1,8-dinitroanthraquinone from dinitration mixtures optionally containing sulphuric acid or a perfluoralkane sulphonic acid which comprises

i. adjusting the nitric acid concentration in the nitration mixture to a value of 91 to 96% for a ratio by weight of nitric acid to solids of from 2.5 : 1 to 10 : 1;

ii. separating off the insoluble crude 1,5-dinitroanthraquinone at 15° to 50°C;

iii. taking up the 1,5-dinitroanthraquinone with 90 to 100% nitric acid in a ratio by weight of nitric acid to solids of from 0.5 : 1 to 3.5 : 1;

iv. stirring at 15° to 80°C;

v. separating off the insoluble pure 1,5-dinitroanthraquinone thus obtained;

vi. adjusting the mother liquid left following separation of the crude 1,5-dinitroanthraquinone to a nitric acid concentration of from 88 to 94% for a ratio by weight of nitric acid to solids of from 3.0 : 1 to 12 : 1, with the proviso that the nitric acid concentration is at least 1.5% lower than in the preceding separation of crude 1,5-dinitroanthraquinone; and

vii. separating off the pure 1,8-dinitroanthraquinone obtained in this way at a temperature in the range of from 20° to 50°C and freeing it from the nitric acid adhering thereto.

3,963,763

ANTHRAQUINONE DYESTUFFS

Volker Hederich, Cologne; Friedrich Wilhelm Kröck, Opladen; Güenter Gehrke, Cologne, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

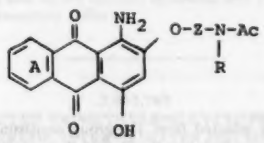
Filed Oct. 9, 1974, Ser. No. 513,485

Claims priority, application Germany, Oct. 13, 1973, 2351517

Int. Cl.² C07C 49/68

U.S. Cl. 260—376 5 Claims

1. Anthraquinone dyestuffs of the formula



wherein

R comprises hydrogen; unsubstituted straight chain branched alkyl radicals having 1-9 carbon atoms; or C_1–C_4 alkyl radicals substituted by hydroxyl, nitrile, C_1–C_8 alkoxy, C_1–C_8 alkyl mercapto, C_1–C_8 dialkylamino; cyclohexylamino; phenyloxy wherein the phenyl group is unsubstituted or substituted with C_1–C_8 alkyl, C_1–C_4 alkoxy, C_1–C_4-alkylmercapto or halogen; phenylmercapto wherein the phenyl group is unsubstituted or substituted with C_1–C_8 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylmercapto, or halogen; napthyloxy, wherein the naphthyl group is substituted or unsubstituted with C_1–C_8 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl mercapto, or halogen; or napthylmercapto wherein the napthyl group is substituted or unsubstituted with C_1–C_8 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylmercapto, or halogen;

Z comprises an alkylene radical having 2–6 carbon atoms in the main chain;

Ac is UV wherein U is —CO—, —SO_2—, —CO_2— or —CO—NH—, and

V is alkyl or alkenyl having 1–17 carbon atoms unsubstituted or substituted with a lower alkoxy or a phenoxy group or with halogen or with nitrile; cycloalkyl; phenyl; phenyl substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylmercapto, nitrile, phenyl, or cyclohexyl; napthyl; napthyl substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylmercapto, nitrile, phenyl, or cyclohexyl; or hydrogen and wherein the nucleus A is not further substituted; with the proviso that V can only be hydrogen if U is —CO— or —CONH—. .

3,963,764

INDOANILINES

Grégoire Kalopissis, Paris; Andrée Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 249,227, May 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 213,750, Dec. 29, 1971, Pat. No. 3,867,094. This application May 27, 1975, Ser. No. 580,830

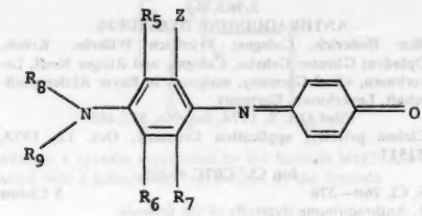
Claims priority, application Luxemburg, May 10, 1971, 63145; May 10, 1971, 63144; Dec. 30, 1970, 62348

Int. Cl.² C07C 119/14; C07D 265/36

U.S. Cl. 260—396 N 4 Claims

1. An idoaniline selected from the group consisting of

a. an indoaniline having the formula



wherein Z is selected from the group consisting of amino, acetylamino and hydroxy; R_5, R_6 and R_7 each independently are selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–16 carbon atoms; R_8 is selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and together with R_5 and the nitrogen atom to which R_8 is attached form dihydro-paroxazine; R_9 is selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and together with R_6 and the nitrogen atom to which R_9 is attached form dihydro-paroxazine, with the proviso that at least two of R_5, R_6, R_7, R_8 and R_9 are other than hydrogen when Z is NH_2 and that only one of R_8 and R_9 form dihydro-paroxazine and

b. an acid salt of said indoaniline in (a).

3,963,765

PREPARATION OF DERIVATIVES OF CHOLESTEROL

Yehuda Mazur, 14 Haknesset Hagdola St., Tel Aviv, and Avner Rotman, 8 Hagoren St., Rehovot, both of Israel

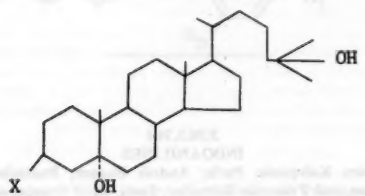
Continuation-in-part of Ser. No. 454,394, March 25, 1974, Pat. No. 3,920,531. This application July 11, 1974, Ser. No. 487,432

Claims priority, application Israel, Apr. 1, 1973, 41923

Int. Cl.² C07J 9/00

U.S. Cl. 260—397.2 **12 Claims**

1. A process for preparing derivatives of cholestane of the formula



wherein X is —OH or —$OCOCH_3$, said process comprising subjecting 3β-acetoxy-5α-hydroxy cholestane, dissolved in a solvent, in the presence of peracetic acid to irradiation with ultra-violet light having a wavelength of less than 350 mμ, to form 3β-acetoxy-5α, 25-dihydroxy cholestane, removing the solvent, separating said 3β-acetoxy-5α,25-dihydroxy cholestane and converting same to the corresponding trihydroxy-derivative by treatment with an aqueous solution of an alkali metal hydroxide in a lower alkanol and dioxane.

3,963,766

PROCESS FOR SEPARATION OF 19-NOR-Δ⁴-ANDROSTENE-3,17-DIONE

Ken-ichi Wakabayashi, and Susumu Kanno, both of Machida, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

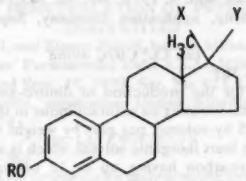
Filed Jan. 31, 1975, Ser. No. 545,900

Claims priority, application Japan, Feb. 26, 1974, 49-22534

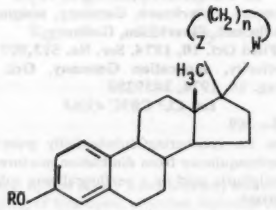
Int. Cl.² C07J 1/00, 43/00

U.S. Cl. 260—397.3 **15 Claims**

1. In a process for separating 19-nor-Δ⁴-androstene-3,17-dione from a mixture of steroids which is obtained by the Birch reduction of an alkyl or an aralkyl ether of estrone acetal having the following formula (I),



wherein R is selected from the group consisting of an alkyl group containing 1 to 10 carbon atoms and an aralkyl group containing a side chain of 1 to 5 carbon atoms; X and Y are selected from the group consisting of O-alkyl and S-alkyl groups, respectively, containing 1 to 10 carbon atoms; or the following formula (II):



wherein R is as defined above; Z and W are selected from the group consisting of oxygen atom and sulfur atom; and *n* represents an integer of from 2 to 10; followed by the hydrolysis of the obtained reduction product of said Birch reduction, the improvement which comprises:

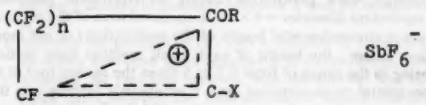
1. reacting said mixture of steroids containing 19-nor-Δ⁴-androstene-3,17-dione with a secondary amine selected from the group consisting of pyrrolidine piperidine, morpholine and dimethylamine, to form the C_3-enamine of 19-nor-Δ⁴-androstene-3,17-dione;
2. extracting the resultant C_3 enamine of 19-nor-Δ⁴-androstene-3,17 dione with an aqueous solution of an inorganinc acid selected from the group consisting of hydrochloric acid, sulfuric acid, nitric acid, hydrobromic acid, hydroiodic acid, phosphoric acid, sodium hydrogen sulfate and sodium hydrogen sulfite, and then;
3. hydrolyzing the separated C_3-enamine of 19-nor-Δ⁴-androstene-3,17-dione.

3,963,767
METHOXYPERFLUOROCYCLOALKENIUM HEXAFLUOROANTIMONATE SALTS

Bruce Edmund Smart, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 3, 1975, Ser. No. 609,997
Int. Cl.² C07F 9/90
U.S. Cl. 260—446 15 Claims

1. A compound of the formula



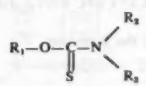
wherein
R is alkyl of 1–4 carbons;
X is F, Cl, Br or OH;
n is 0, 1 or 2; and
the dotted lines indicate ring unsaturation.

3,963,768
PROCESS FOR THE PREPARATION OF THIOCARBAMIC ACID O-ESTERS

Hans Millauer, Eschborn, Taunus, and Gerhard Edelmann, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

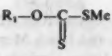
Filed Dec. 13, 1974, Ser. No. 532,412
Claims priority, application Germany, Dec. 22, 1973, 2364316
Int. Cl.² C07C 155/02
U.S. Cl. 260—455 A 5 Claims

1. Process for the preparation of thiocarbamic acid-O-esters of the formula



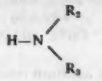
I

in which R_1 stands for a linear or branched alkyl radical of 1 to 8 carbon atoms or a cycloalkyl radical of 4 to 6 carbon atoms, and R_2 and R_3 independently from each other stand for a linear or branched radical of 1 to 6 carbon atoms or such an alkyl radical is substituted by a group selected from —(O—CH_2—CH_2)$_n$—OH, —(O—CH_2—CH_2)$_n$—O—CH_3 and —O—(CH_2)$_m$—CH_3, *n* being 0, 1 or 2 and *m* being 1 or 2, or stand for cycloalkyl radical of 4 to 6 carbon atoms and one of the radicals R_2 and R_3 also stands for hydrogen, which process consists essentially of reacting at a temperature ranging between 20° and 120°C in an aqueous or water-containing medium 1 mol of a xanthogenate of the formula



II

in which R_1 is defined as above and Me is an alkali metal with a primary or secondary aliphatic amine of the formula



III

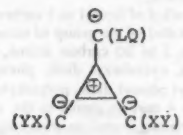
in which R_2 and R_3 are defined as above, and 1.2 to 5 gram atoms of elementary sulfur.

3,963,769
SUBSTITUTED TRIMETHYLENE CYCLOPROPANES, SALTS THEREOF, INTERMEDIATES AND METHODS OF MAKING THE SAME

Tadamichi Fukunaga, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1974, Ser. No. 535,138
Int. Cl.² C07C 120/00, 121/46, 121/48
U.S. Cl. 260—464 23 Claims

1. A compound having the formula



wherein X and Y are selected from cyano, -COO(lower alkyl) or -CO(lower alkyl) and L and Q are independently selected from cyano, —COO(lower alkyl) or —CO(lower alkyl) or pairwise from H and nitro; lower alkyl and nitro; hydrogen and lower alkyl sulfono or lower alkyl and lower alkyl sulfono, and M^+ is one equivalent of an inert cation, said compound containing at least one cyano.

3,963,770
SYNTHESIS OF ORTHO-CHLOROBENZALMALONONITRILE

John S. Knapp, Pittsburgh, Pa., assignor to Federal Laboratories, Inc., Saltsburg, Pa.

Continuation-in-part of Ser. No. 292,490, Sept. 27, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,571
Int. Cl.² C07C 121/70
U.S. Cl. 260—465 G 10 Claims

1. A batch process for the synthesis of ortho-chlorobenzalmalononitrile, comprising, the steps of:

a. mixing in methanol malononitrile with o-chlorobenzaldehyde in the presence of a catalytic amount of a basic amine catalyst;
b. heating the resulting solution to 35° to 55°C;
c. physically separating the resulting product crystals from said methanol;
d. washing the product crystals with fresh methanol;
e. combining the resulting methanol washings with said methanol filtrate;
f. reusing the combined methanol in another similar series of steps *a* – *e* as above defined;
g. and repeating a batch series of such synthesis until said methanol contains an excessive amount of impurities; whereby less volume of methanol solvent is used overall and associated problems of effluent treatment and air pollution are minimized.

3,963,771

AMINE ACRYLATE ADDITION REACTION PRODUCTS

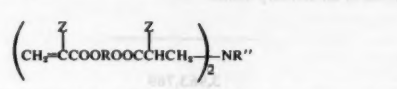
John Howard Robson, and Erich Marcus, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

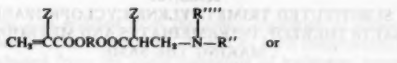
Division of Ser. No. 69,136, Sept. 2, 1970, Pat. No. 3,845,056, which is a continuation-in-part of Ser. No. 6,939, Jan. 29, 1970, abandoned. This application Aug. 22, 1974, Ser. No. 499,636

Int. Cl.² C07C *101/20, 101/44*

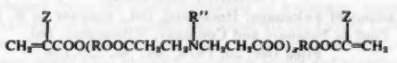
U.S. Cl. 260—482 R 7 Claims

1. An amine acrylate addition reaction product of a primary or secondary organic amine and a polyacrylate, said reaction product being selected from the group of:





or



wherein Z is hydrogen or methyl;

R'' is alkyl of from 1 to 5 carbon atoms, cycloalkyl of from 5 to 10 carbon atoms, or aryl or aralkyl or alkaryl of from 6 to 12 carbon atoms;

R'''' is hydrogen or alkyl of from 1 to 5 carbon atoms; and

R is the residue of a diol of the group of saturated aliphatic diols having from 2 to 20 carbon atoms, bicyclo[2.2.1-]hept-2-ene diols, cyclohexyl diols, phenyl and mono- and di- lower alkyl phenyl diols, polyalkylene ether diols having from 2 to 4 carbon atoms in the alkylene group and ester glycols having from 1 to an average of 17.5 ester groups; and

x has a value of from 1 to 4.

3,963,772

ALTERNATING ALKYLENE/ACRYLIC TELOMERS

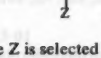
Tsuneichi Takeshita, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 9, 1973, Ser. No. 331,208

Int. Cl.² C07C *69/34*

U.S. Cl. 260—485 H 1 Claim

1. A liquid telomeric composition of the structural formula $Br(D—A)_xY$ where Y is $—CCl_3$, $—CH_2Br$ or $—C(CH_3)_2CO_2H$, wherein D is $—CH_2—CR_4R_5—$, R_4 and R_5 are independently selected from H, Br, Cl and alkyl having a length of 1 to 22 carbon atoms, and A is



where Z is selected from $—CO_2R_6$ where R_6 is an alkyl of 1 to 8 carbon atoms, and wherein *n* is an integer large enough to give a molecular weight of about 300 to 50,000.

3,963,773

PROCESS FOR THE PRODUCTION OF PERACETIC ACID

Toshiharu Ishi, Otake; Akira Asahi, Yamaguchi; Hiroaki Fujita, Otake; Takeshi Sato, Otake, and Nobusuke Urabe, Otake, all of Japan, assignors to Daicel, Ltd., Osaka, Japan

Continuation of Ser. No. 888,321, Dec. 29, 1969, abandoned. This application June 13, 1974, Ser. No. 479,031

Int. Cl.² C07C *179/12*

U.S. Cl. 260—502 A 5 Claims

1. In a process for the production of peracetic acid by the catalytic reaction of acetaldehyde with gaseous molecular oxygen or molecular oxygen-containing gas, in which a liquid mixture of acetaldehyde with an inert organic solvent and gaseous molecular oxygen or molecular-oxygen containing gas is fed into the bottom of an upright cylindrical reactor vessel means and is flowed upwardly therethrough to produce a reaction product containing peracetic acid, the improvement which comprises: employing upright cylindrical reactor vessel means containing therein internal upright cooling tube means spaced from the internal wall of the vessel means to provide a vertical reaction zone between the internal wall means of the vessel means and the external wall means of said cooling tube means, said reaction zone being divided into at least three small reaction zone sections by at least two horizontal partition plates each having a plurality of perforations therethrough, each perforation having an equivalent diameter (equivalent diameter = 4 × cross-sectional area of the perforation ÷ circumferential length of the perforation) of not more than 8 mm., the height of each small reaction zone section being in the range of from 0.3 to 5 times the square root of its horizontal cross-sectional area, continuously feeding into the bottom small reaction zone section (1) the liquid mixture of acetaldehyde with an inert organic solvent and (2) gaseous molecular oxygen or molecular oxygen-containing gas, flowing the liquid and the gas upwardly in series through the reaction zone sections in concurrent flow relationship, at an average flow velocity of the gas within the range of 0.4 – 6.0 m. per second through the perforations and within the range of 0.04 – 0.15 m. per second calculated as the superficial column velocity, with the liquid and gas passing upwardly in unidirectional flow through the perforations of each partition plate into the next higher small reaction zone section while forming and substantially uniformly dispersing the gas bubbles in the liquid in each small reaction zone section to effect turbulent agitation of the contents of each reaction zone section, removing the reaction heat by passing a coolant through the cooling tube means, and withdrawing from the uppermost reaction zone section a reaction product containing peracetic acid and a gas containing unreacted oxygen.

3,963,774

ANILINO DERIVATIVES OF CHELOCARDIN

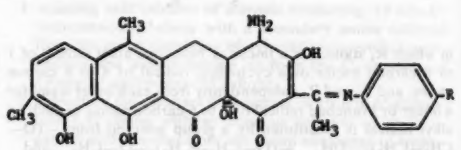
Daniel Tim-Wo Chu, Greenfield Park, and David Lyon Garmaise, Montreal, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 378,305, July 11, 1973, Pat. No. 3,894,061. This application Mar. 3, 1975, Ser. No. 554,849

Int. Cl.² C07C *97/10, 101/48*

U.S. Cl. 260—519 3 Claims

1. A compound of the formula:



wherein R is hydrogen, carboxymethyl, or carboxy, or the corresponding tautomeric forms or a pharmaceutically acceptable acid addition salt thereof.

3,963,775

PROCESS FOR THE PRODUCTION OF 3-OXOGLUTARIC ACID

Nico Heyboer, Dieren, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Feb. 26, 1974, Ser. No. 445,941
Claims priority, application Netherlands, Mar. 1, 1973, 7302863
Int. Cl.² C07C 59/12
U.S. Cl. 260—535 P 10 Claims

1. A process for the preparation of 3-oxoglutaric acid and derivatives comprising

a. reacting ketene with phosgene in an organic solvent having a dielectric constant between 2 and 22 measured at 20°C,

b. reacting the product of (a) with a compound containing an active hydrogen atom according to Zerewitinoff, and

c. isolating the resulting product, with the proviso that the molar ratio between the total amount of ketene and the total amount of phosgene is less than 2.

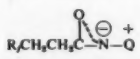
3,963,776

AMINE FLUOROACYLIMIDE SURFACTANTS

William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 24, 1974, Ser. No. 482,576
Int. Cl.² C07C 103/38
U.S. Cl. 260—561 H 7 Claims

1. A compound having the formula



wherein R_f is a straight chain fluorocarbon radical of 6 to 16 carbon atoms and Q^+ is derived from a water-soluble tertiary amine Q having from 3 to 6 carbon atoms and up to 3 oxygen atoms in the form of oxa or hydroxy groups.

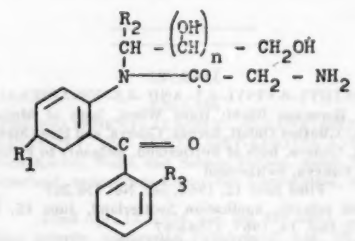
3,963,777

1-POLYHYDROXY ALKYL-1,4-BENZODIAZEPIN-2-ONES

Joseph Hellerbach, Basel; Henri Hoffmann, and Guido Zanetti, both of Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 397,043, Sept. 13, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,132
Int. Cl.² C07C 103/32
U.S. Cl. 260—562 N 1 Claim

1. A compound of the formula



wherein R_1 signifies halogen, R_2 signifies hydrogen or lower alkyl, R_3 signifies hydrogen or halogen and n is an integer from 1–2.

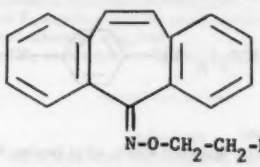
3,963,778

BASIC OXIMES AND THEIR PREPARATION

Siegismund Schütz; Otto Behner, and Friedrich Hoffmeister, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 587,696, Oct. 19, 1966, abandoned. This application July 14, 1969, Ser. No. 849,539
Claims priority, application Germany, Nov. 10, 1965, 47635
Int. Cl.² C07C 131/06
U.S. Cl. 260—566 AE 3 Claims

1. A compound selected from the group consisting of



and pharmaceutically acceptable non-toxic acid salts thereof.

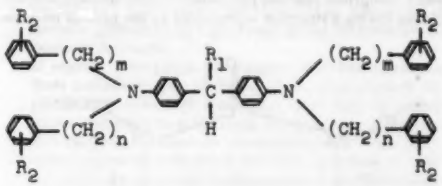
3,963,779

NOVEL ORGANIC PHOTOCONDUCTIVE COMPOUND

Hirokazu Tsukahara, and Kazuhiro Emoto, both of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Filed Sept. 5, 1972, Ser. No. 286,140
Claims priority, application Japan, Sept. 10, 1971, 46-70618
Int. Cl.² C07G 87/28
U.S. Cl. 260—570 R 6 Claims

1. A novel photoconductive compound having the general formula,



wherein R_1 is an alkyl group having 1–11 carbon atoms, R_2 is a member selected from the group consisting of hydrogen, methyl, nitro and halogens and n and m are integers of 1 or 2 and may be the same or different.

3,963,780
N,N'-DISUBSTITUTED-P-PHENYLENEDIAMINES

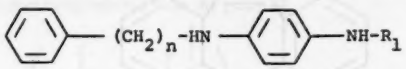
Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 211,109, Dec. 22, 1971, Pat. No. 3,819,708, and a continuation-in-part of Ser. No. 118,517, Feb. 24, 1971, abandoned, and a continuation-in-part of Ser. No. 118,518, Feb. 24, 1971, abandoned. This application Feb. 14, 1974, Ser. No. 442,615

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.8 R 4 Claims

1. A compound of the formula



where

n is 2, 3, or 4, and

R_1 is a straight or branched chain alkyl having 5 to 11 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

3,963,781
METHOD OF PREPARING 2-HYDROXY-3-ALKYL-2-CYCLOPENTEN-1-ONE

Hiroyuki Kyomori, Yachiyo; Kazuhiro Sasaki, Fuchu, and Mitsuhiro Takahashi, Tokyo, all of Japan, assignors to Kobayashi Perfumery Co., Ltd., Tokyo, Japan

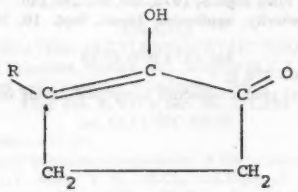
Filed Dec. 18, 1974, Ser. No. 534,000

Claims priority, application Japan, Mar. 5, 1974, 49-25518; Dec. 6, 1974, 49-139607

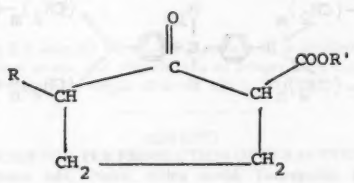
Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R 13 Claims

1. A method of preparing 2-hydroxy-3-alkyl-2-cyclopenten-1-one whose chemical structure may be expressed by the general formula



which comprises: reacting (a) 2-alkyl-5-carboalkoxycyclopentanone having a structure represented by the general formula:



R and R^1 in the foregoing formulae representing lower alkyl radicals selected from the group consisting of methyl, ethyl, n-propyl and butyl,

with (b) a nitrite selected from the group consisting of potassium nitrite and sodium nitrite at a temperature between about 0° to 60°C for a period ranging between about 1 to 60 hours, the mol ratio of nitrite to reactant (a) being between 1:1 and 3:1, in the presence of (c) water in an amount of 200 to 2000 ml per mol of reactant (a) and (d) alkali selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium carbonate and potassium carbonate, the mol ratio of alkali to reactant (a) being between about 1:1 and 3:1,

rendering the reaction system acidic at a temperature level lower than room temperature by adding an acid selected from the group consisting of hydrochloric acid and sulfuric acid to the reaction system in an amount of 2.3 to 11 equivalents per mol of reactant (a), and

thermally treating the reaction system for hydrolysis at a temperature between about 40° and 100°C.

3,963,782
5-ACETYL-1,2,6-TRIMETHYLTRICYCLO[5,3,2,0^{2,7}]DODECA-5-ENE

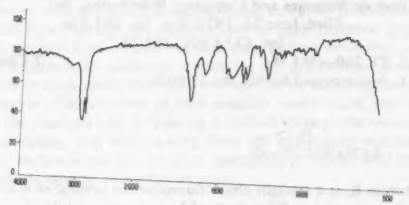
Akira Nagakura, Kawaguchi; Susumu Akutagawa, Yohohama, and Haruki Kurihara, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 537,002

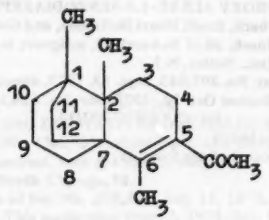
Claims priority, application Japan, Apr. 1, 1974, 49-36747

Int. Cl.² C07C *49/61*

U.S. Cl. 260—586 G 1 Claim



1. 5-Acetyl-1,2,6-trimethyltricyclo[5,3,2,0^{2,7}]dodeca-5-ene having the formula (I)



(I)

3,963,783
4-METHYL-8-VINYL-4,7- AND -4,8-NONADIENALS

George Hermann Büchi; Hans Wüest, both of Mattapan, Mass.; Günther Ohloff, Bernex, Geneva, and Hugo Strickler, Onex, Geneva, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed June 12, 1968, Ser. No. 736,267

Claims priority, application Switzerland, June 15, 1967, 8529/67; Dec. 14, 1967, 17568/67

Int. Cl.² C07C *47/20*

U.S. Cl. 260—601 R 3 Claims

1. As a new composition of matter, a nonadienal selected from the group consisting of 4-methyl-8-vinyl-4,7-nonadienal and 4-methyl-8-vinyl-4,8-nonadienal.

3,963,784

PROCESS FOR THE PREPARATION OF ALDEHYDES

Philip E. Pfeffer, Warrington, and Leonard S. Silbert, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 203,917, Dec. 1, 1971, abandoned, which is a division of Ser. No. 853,505, Aug. 27, 1969, Pat. No. 3,652,612. This application Dec. 19, 1973, Ser. No. 426,159

Int. Cl.[2] C07C *45/18*

U.S. Cl. 260—601 R 1 Claim

1. A direct process for the preparation of aldehydes, comprising the steps of:

a. metalating with lithium diisopropylamide in a mixed solvent system of tetrahydrofuranhexane-hexamethylphosphoramide at a temperature below 0°C., a carboxylic acid selected from the group consisting of unsubstituted straight chain saturated and olefinically unsaturated straight chain hydrocarbyl carboxylic acids having from 7 to 18 carbon atoms, the point of unsaturation of said unsaturated acids being at least four carbon atoms from the carboxylic acid function, to form a dianion of said carboxylic acid;

b. reacting said dianion in the aforesaid mixed solvent system with ethyl formate at a temperature of from about −5° to 0°C. to form an alpha-aldehyde salt and lithium ethoxide;

c. warming the alpha-aldehyde acid salt in the mixed solvent system to a temperature below 55°C. to effect decarboxylation; and

d. acidifying with a dilute acid solution the product of step (c) to obtain a free aldehyde in slightly acidic media.

3,963,785

MERCAPTANS BY ADDITION OF HYDROGEN SULFIDE TO OLEFINS IN PRESENCE OF CARBON DISULFIDE

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 1, 1975, Ser. No. 573,505

Int. Cl.[2] C07C *148/00, 149/26, 149/06*

U.S. Cl. 260—609 B 5 Claims

1. In the preparation of mercaptans by contacting a reaction mixture of hydrogen sulfide and ethylenically unsaturated compounds in the presence of a sulfactive catalyst a method for increasing the total conversion of reactants to mercaptans comprises adding carbon disulfide to the reaction mixture in a molar ratio of hydrogen sulfide to carbon disulfide of from about 5/1 to about 30/1.

3,963,786

PHENOXYPHENYLALKOXY-, ALKENYLOXY-, ALKINYLOXY- AND BENZYLOXY-ALKOXY ETHERS

Friedrich Karrer, Basel, and Saleem Farooq, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

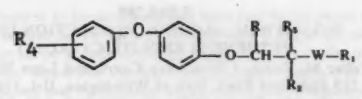
Filed Apr. 17, 1975, Ser. No. 569,040

Claims priority, application Switzerland, Apr. 18, 1974, 5364/74; Mar. 12, 1975, 3123/75

Int. Cl.[2] C07C *43/20*

U.S. Cl. 260—613 R 16 Claims

1. A compound of the formula



wherein

W represents —O—,

R_1 represents C_1–C_6-alkyl, C_3–C_6-cycloalkyl or C_5–C_6-cycloalkenyl, C_3–C_4-haloalkenyl, C_3–C_5-alkynyl, C_2–C_6-alkenyl or benzyl,

R_2 represents hydrogen, methyl or ethyl,

R_3 represents hydrogen or methyl, or

R_2 and R_3 together with the chain represent a 5- or 6-membered saturated ring, and

R_4 and R_5 each represent hydrogen or methyl.

3,963,787

PROCESS FOR PRODUCING DIPHENYLS

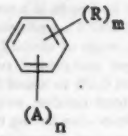
Yataro Ichikawa, and Teizo Yamaji, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 60,945, Aug. 4, 1970, abandoned. This application Jan. 24, 1973, Ser. No. 326,523

Int. Cl.[2] C07C *43/20, 25/00, 15/14*

U.S. Cl. 260—613 R 4 Claims

1. A process for producing diphenyls which comprises contacting benzene or a benzene derivative expressed by the following formula



wherein R's may be the same or different and represent alkyl having 1 to 4 carbon atoms;

m is a positive integer of 0 to 4;

A's may be the same or different and represent alkoxy having 1 to 4 carbon atoms or a halogen atom;

n is a positive integer of 0 to 2; and the sum of *m* and *n* does not exceed 3, and when *m* is 0 or *n* is 0, $-(R)_m$ or $-(A)_n$ respectively represents a hydrogen atom,

with molecular oxygen, at a pressure of from 3 to 300 atmospheres calculated as the partial pressure of oxygen and at a temperature in the range of 100° to 300°C., in the presence of a catalyst comprising

1. at least one organic carboxylate of palladium (II) in an amount of 1×10^{-5} to 1×10^{-1} gram-atom, calculated as metallic palladium, per gram-mol of the benzene of the benzene derivative,

said organic carboxylate of palladium (II) being selected from palladium salts of mono- basic unsubstituted aliphatic carboxylic acids having not more than 20 carbon atoms which can be substituted by at least one of chlorine and fluorine, cyclohexane monocarboxylate, methyl cyclohexane monocarboxylate, benzoate, o-toluate, m-toluate, p-toluate, p-tertiary butylbenzoate, o-methoxybenzoate, m-methoxybenzoate, p-methoxybenzoate, chlorobenzoate and naphthoate, and

2. at least one zirconium (IV) compound in an amount of 0.01 – 100 gram-atoms, calculated as zirconium metal, per gram-atom of the palladium;

said zirconium (IV) compound being selected from the group consisting of

A. zirconium (IV) salts of oxyformic acid, oxyacetic acid, oxypropionic acid, oxy-n-butyric acid, oxy-isobutyric acid; and

B. oxychloride of zirconium (IV).

3,963,788

POLYHYDRIC ALCOHOL PRODUCTION USING RUTHENIUM ZEOLITE CATALYST

Walter M. Kruse, 1 Woodbury Court, and Leon W. Wright, 215 Oakwood Road, both of Wilmington, Del. 19803

Continuation-in-part of Ser. No. 498,969, Aug. 20, 1974, abandoned. This application Nov. 5, 1974, Ser. No. 520,926

Int. Cl.² C07C *31/18*

U.S. Cl. 260—635 C 13 Claims

1. A process for the production of a polyhydric alcohol from a carbohydrate selected from the group consisting of monosaccharides, readily hydrolyzable polysaccharides and mixtures thereof, which comprises contacting said carbohydrate in an aqueous medium with hydrogen at a temperature in the range of about 100° to about 200°C and a pressure of at least about 100 psig. in the presence of a ruthenium-containing aluminosilicate zeolite catalyst of the molecular sieve type having pores of uniform size and having a silica/alumina mol ratio of at least about 3.

3,963,789

POLYHYDRIC ALCOHOL PRODUCTION USING RU ON CLAY SUPPORTS

Walter M. Kruse, 1 Woodbury Court, and Leon W. Wright, 215 Oakwood Road, both of Wilmington, Del. 19803

Filed Dec. 12, 1974, Ser. No. 531,972

Int. Cl.² C07C *31/18*

U.S. Cl. 260—635 C 9 Claims

1. A process for the production of a polyhydric alcohol or mixture thereof which comprises contacting an essentially water soluble polysaccharide-containing carbohydrate in aqueous medium with hydrogen at a temperature in the range of about 100° to about 200° C., a pressure of at least about 100 psig, and a pH in the range of about 2.5 to about 4.5, in the presence of a catalyst comprising ruthenium wherein the catalyst contains about 0.1% to about 5% by weight of ruthenium, based on the total catalyst weight, an acid activated crystalline aluminosilicate clay having base exchange capacity and having a layer structure comprising a plurality of sheet-like layers, said layers including at least one tetrahedral silica layer and at least one octahedral alumina layer.

3,963,790

NON-INFLAMMABLE FILAMENTS COMPRISING ACRYLONITRILE/VINYLIDENE CHLORIDE COPOLYMERS

Paul Couchoud, Dardilly, France, assignor to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 377,199, July 9, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,833

Claims priority, application France, Aug. 9, 1972, 72.29009

Int. Cl.² C08L *33/20*

U.S. Cl. 260—898 7 Claims

1. Non-inflammable filaments of at least two incompatible copolymers of acrylonitrile and vinylidene chloride, said filaments having:

a. a sticking temperature of at least 215°C.,

b. a shrinkage of less than 32% when subjected to steam at 130°C. in the unrestrained state,

c. two distinct phases, a continuous phase and a dispersed phase, the average size of the dispersed phase particles being less than 3 microns,

d. the following composition:

i. at least about 50 weight percent of the filament being a copolymer of about 79.5 to about 58 weight percent of acrylonitrile, 20 to about 40 weight percent of vinylidene chloride, and about 0.5 to about 2 weight percent of a comonomer which enhances dyeability, and

ii. less than about 50 weight percent of a second copolymer of about 20 to about 50 weight percent of acrylonitrile and about 50 to about 80 weight percent of vinylidene chloride,

e. and a chlorine content of 25 to about 40% by weight.

3,963,791

PROCESS FOR TRANSFORMING HYDROCARBON POLYMERS INTO PHOTODEGRADABLE POLYMERS

Luigi Giuffre; Italo Pasquon, both of Milan; Enrico Cernia, Rome; Vittorio Pozzi, and Arthur Silvers, both of Milan, all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Nov. 15, 1974, Ser. No. 524,310

Claims priority, application Italy, Nov. 21, 1973, 31500/73

Int. Cl.² C08F *8/30*

U.S. Cl. 526—22 3 Claims

1. A process for rendering a hydrocarbon polymer photodegradable which consists in reacting the polymer with a member of the group consisting of NOCl, $NOHSO_4$, N_2O_3, NO and RO-NO wherein R is alkyl or aryl, in the heterogeneous phase in an acid environment and in the temperature range of from −80° to 100°C so that —NO groups are introduced into the polymer chain which are converted into >N—OH groups, and then subjecting the resultant polymer to hydrolysis so that the >N—OH groups are converted into photosensitive >C=O groups.

3,963,792

PROCESS FOR PRODUCTION OF CYCLIC POLYENES

Yasuhiro Takeshita, Chiba, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

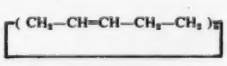
Filed Aug. 26, 1974, Ser. No. 500,700

Claims priority, application Japan, Aug. 30, 1973, 48-96626

Int. Cl.² C07C *3/10*, *13/00*

U.S. Cl. 260—666 A 8 Claims

1. A polymerization process for producing cyclic polyenes having the general formula



wherein *n* is from 2 to 4, comprising polymerizing cyclopentene by contacting it with a catalyst consisting essentially of a composition of (i) trialkyl aluminum containing as the alkyl group a C_1–C_6 alkyl group, (ii) tungsten hexahalide; and (iii) allyl halide or methallyl halide at a temperature between about −20° to 100°C; in the said catalyst, the molar ratio of trialkyl aluminum to tungsten hexahalide is between about 4:1 and 15:1, the molar ratio of allyl halide or methallyl halide to tungsten hexahalide is between about 40:1 and 120:1, and the amount of tungsten hexahalide is from 0.0001 to 0.1 moles per 1 mole of cyclopentene.

3,963,793

PROCESS FOR PREPARING DEHYDRODIMERIZATION PRODUCTS

Cornelis A. M. Weterings, Stein, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 18, 1974, Ser. No. 534,100

Claims priority, application Netherlands, Dec. 18, 1973, 7317293

Int. Cl.² C07C *15/18*, *11/12*

U.S. Cl. 260—668 R 18 Claims

1. In a process for dehydrodimerization compounds of the formula CH_3—R,

wherein R represents a group that is not reactive under the dehydrodimerization reaction: wherein R contains a carbon atom which is unsaturated, wherein CH_2— and R are attached to each other by bonding of said methyl group to said unsaturated carbon atom;

comprising contacting CH_3—R with a dehydrodimerization catalyst at elevated temperatures,

the improvement comprising, contacting R—CH_3 at temperatures between 300°–400°C with a catalytic composition comprising a catalyst on a support, wherein said catalyst is thallium trioxide, bismuth trioxide or mixtures thereof; said support comprising an oxide of an element

of Group II of the Periodic Table of Elements and having a surface area of at least 20 m^2/g wherein the catalyst comprises 10–80% by weight of the support.

3,963,794
PRODUCTION OF BENZENE

John W. Myers, and William C. Lanning, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

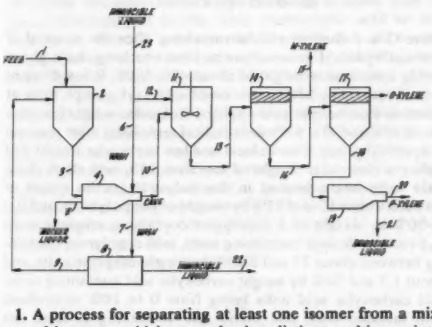
Continuation-in-part of Ser. No. 121,016, June 30, 1961, Pat. No. 3,296,323. This application Dec. 7, 1965, Ser. No. 512,100
Int. Cl. C07c *3/58, 15/04*
U.S. Cl. 260—672 NC **4 Claims**

1. In a process for hydrodealkylating alkylated monocyclic aromatic hydrocarbons in an alkylated monocyclic aromatic-containing hydrocarbon fraction wherein such fraction is subjected to thermal conversion in a reaction zone devoid of catalytically active material in the presence of hydrogen at a temperature ranging from 950°F to 1,450°F at a pressure ranging from 400 pounds per square inch to 10,000 pounds per square inch for a time ranging from 1 second to 600 seconds with the amount of hydrogen ranging from 1.0 to 20.0 moles of hydrogen per mole of the normally liquid hydrocarbon charge, the improvement which comprises increasing the yield of recoverable monocyclic aromatic hydrocarbons by introducing diphenyl into the reaction zone together with the alkylated monocyclic aromatic-containing hydrocarbon fraction, said diphenyl being in an amount ranging from 1 mole percent to 15 mole percent based on the total moles of normally liquid hydrocarbon charge to the reaction zone, and recovering the monocyclic aromatic hydrocarbons.

3,963,795
SEPARATION OF ISOMERS BY SELECTIVE MELTING IN AN IMMISCIBLE LIQUID

George R. Wood, Winfield, and Chang-Man Park, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 20, 1974, Ser. No. 535,032
Int. Cl.² C07C *7/14*
U.S. Cl. 260—674 A **9 Claims**



1. A process for separating at least one isomer from a mixture of isomers, said isomers having distinct melting points, which process comprises the steps of:

a. cooling said mixture of isomers to a temperature below the crystallization temperature of the isomer to be separated to obtain crystals of discrete isomers in mother liquor;

b. separating said crystals from said mother liquor;

c. displacing adhering mother liquor from said crystals and admixing said crystals with an immiscible liquid cooled to a temperature below the melting point of the isomer to be separated and having a specific gravity that is higher than the specific gravity of the liquid phase of the isomer to be separated but lower than the specific gravity of the crystalline phase of said isomers;

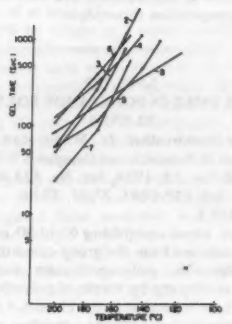
d. heating the mixture of step (c) to at least the melting point of said isomer to be separated to selectively melt said isomer to be separated and form said liquid phase of said isomer to be separated, said liquid phase of said isomer to be separated being distinct from both the immiscible liquid and the remaining of said crystals; and

e. separating said liquid phase of said isomer to be separated from the product of step (d).

3,963,796
EPOXY RESIN COMPOSITION HAVING EXCELLENT LATENT HARDENING CHARACTERISTICS

Hitoshi Yokono, Katsuta; Akio Nishikawa, Hitachi; Ritsuro Tada, Mitoshi, and Yasuo Miyadera, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., Japan

Filed Jan. 6, 1971, Ser. No. 104,398
Claims priority, application Japan, Jan. 6, 1970, 45-2386
Int. Cl. C08g *45/06*
U.S. Cl. 260—830 TW **8 Claims**



1. An epoxy resin composition comprising an epoxy resin selected from the group consisting of polyglycidyl ethers of bis-phenol A and epichlorohydrin, polyglycidyl ethers of a novolac resin and combinations thereof and diaminodiphenylmethane dicarboxylic acid in an amount of substantially equivalent ratio with respect to said epoxy resin.

3,963,797
ACRYLIC ELASTOMER COMPOSITIONS WITH IMPROVED AGING PROPERTIES

Rudolf Adolf Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 27, 1974, Ser. No. 527,672
Int. Cl.² C08G *45/04*
U.S. Cl. 260—837 R **3 Claims**

1. An acrylate elastomer composition which is a copolymer of one or more acrylic acid esters and from about 0.5 to 15 weight percent based on the elastomer composition of vinyl chloroacetate comprising from about 1 to 20 weight percent, based on the weight of said elastomer, of a compound containing at least one epoxy group and having an epoxide equivalent, defined as the grams of said compound containing 1 gram equivalent of epoxide, of from about 70 to 500.

3,963,798

THIXOTROPIC, RADIATION CURABLE COMPOSITIONS

Lewis S. Miller, Bellevue, Wash., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 304,222, Nov. 6, 1972, Pat. No. 3,839,076, which is a continuation-in-part of Ser. No. 93,855, Nov. 30, 1970, abandoned. This application June 14, 1974, Ser. No. 479,295

Int. Cl.² C08L 63/00

U.S. Cl. 260—837 R 17 Claims

1. A thixotropic coating composition curable by exposure to high-energy radiation produced by incorporating into a hydrophobic, essentially solvent-free resin that is liquid at ambient temperature, curable by exposure to high-energy radiation and essentially free of reactive carboxylic acid groups (1) an additive selected from the group consisting of ZnO, MgO, CaO, SrO, BaO, HgO, PbO, Pb_2O_4, CuO, CdO, NiO, Sb_2O_3, MnO_2, SnO_2, ZrO_2, Fe_2O_3, Co_2O_3, alkali metal oxides and the hydroxides corresponding thereto, said additive being dispersible in said resin in a finely divided state and (2) an acid selected from the group consisting of acrylic acid and methacrylic acid, said additive being reactive with said acid to form a metal salt thereof and water, the amount of said additive being at least 3% by weight of said composition and the amount of said acid being at least the lesser of 0.3 mole per equivalent of said additive and 0.5% by weight of said composition, the amounts of said additive and acid being sufficient to render said composition thixotropic.

3,963,799

GRAFT COPOLYMER IN POLYAMIDE POLYETHYLENE BLENDS

Howard Warner Starkweather, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 13, 1974, Ser. No. 523,467

Int. Cl.² C08L 77/02, 77/06

U.S. Cl. 260—857 L 15 Claims

1. A polymeric blend comprising 60 to 90 parts by weight of a polyamide selected from the group consisting of polyhexamethylene adipamide, polycaprolactam and copolymers thereof and 40 to 10 parts by weight of polyethylene, characterized in that there is present in the blend 1.8 to 8.0 parts by weight of a plastic graft copolymer consisting essentially of a trunk copolymer derived from 70 to 99 percent by weight ethylene and a comonomer providing amine-reactive sites and polycaprolactam side chains having an average degree of polymerization of about 5 to 30 and having end groups selected from the class consisting of N-alkyl amide where alkyl is in the range of 1 to 20 carbon atoms and carboxylic acid, said side chains being linked to said reactive sites through amide or imide linkages, said graft copolymer having a polyamide content of 15 to 50 percent by weight based on the weight of graft copolymer and having two DTA melting points, one at 80° to 115°C. and the other at at least 165°C.

3,963,800

THERMOPLASTICALLY PROCESSABLE ELASTOMERIC COPOLYESTER

Roland Gipp, Cologne; Erwin Müller, Leverkusen, and Wolfgang Oberkirch, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Nov. 29, 1974, Ser. No. 528,087

Claims priority, application Germany, Dec. 4, 1973, 2360287

Int. Cl.² C08L 67/02

U.S. Cl. 260—860 7 Claims

1. A segmented thermoplastically processable elastomeric copolyester which consists essentially of a plurality of recurring polyalkylene terephthalate units and of higher molecular weight polyesters carrying ether groups produced by the process of gradually heating

a. 10–75% by weight of terephthalic acid dialkyl esters having 1 to 4 carbon atoms in the alkyl moieties,

b. 9–70% by weight of a glycol having 2 to 15 carbon atoms and

c. 6–70% by weight of polyesters containing ether groups and having a molecular weight of greater than 6,000 or

i. 10–60% by weight of polyesters containing ether groups and having a molecular weight of greater than 6,000 and

ii. 40–90% by weight of bis-(hydroxyalkyl) terephthalate having 1 to 15 carbon atoms in the alkyl moieties

in the presence of a transesterification catalyst to a temperature of 240°–260°C. initially at atmospheric pressure and subsequently under reduced pressure until the maximum viscosity of the reaction mixture is obtained.

3,963,801

BLENDS OF COPOLYESTERS, ETHYLENE/CARBOXYLIC ACID COPOLYMERS AND A POLYCARBODIIMIDE

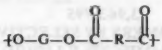
Aaron Chung Liong Su, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 23, 1975, Ser. No. 580,511

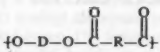
Int. Cl.² C08L 67/06

U.S. Cl. 260—873 12 Claims

1. A blend containing 80 to 99.8% by weight of a copolyester consisting essentially of recurring intralinear long chain ester units and short chain ester units randomly joined head-to-tail through ester linkages, the long chain ester units being represented by the formula



and the short chain ester units being represented by the formula



where G is a divalent radical remaining after the removal of terminal hydroxyl groups from at least one long chain glycol having a molecular weight of about 400–6000; R is a divalent radical remaining after removal of carboxyl groups from at least one dicarboxylic acid having a molecular weight less than about 300; and D is a divalent radical remaining after removal of hydroxyl group from at least one low molecular weight diol having a molecular weight of less than 250, said short chain ester units being present in the polyester to the extent of between about 15 and 95% by weight of the polyester, and 0.2 to 20% by weight of a copolymer containing ethylene units and carboxylic acid containing units, said copolymer containing between about 25 and 98.5% by weight ethylene units, and about 1.5 and 30% by weight carboxylic acid containing units, said carboxylic acid units being from 0 to 10% neutralized with metallic ions, said blend also containing at least one substantially linear polycarbodiimide, said blend having a melt tension of at least 0.4 gm.

3,963,802

BLEND OF ETHYLENE COPOLYMER ELASTOMER AND A COPOLYETHERESTER ELASTOMER

Chi-Kai Shih, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 20, 1975, Ser. No. 588,844

Int. Cl.² C08L 67/06

U.S. Cl. 260—873 9 Claims

1. An elastomeric blend of (A) an ethylene copolymer in which the comonomer is selected from the group consisting of an alpha-olefin, a nonconjugated diolefin, and a mixture of both, said copolymer having a melting point not greater than

85°C., and (B) a segmented copolyetherester consisting of 15–95% by weight of short chain ester units which can be derived from a dicaboxylic acid having a molecular weight not greater than 300 and a diol having a molecular weight not greater than 250, and 5–85% by weight of long chain ester units which can be derived from a dicarboxylic acid having a molecular weight not greater than 300 and a poly(oxyalkylene)glycol having a molecular weight of 400–6000, said copolyetherester having a melting point of at least 100°C.; the weight ratio of A:B in said blend being 1:20 to 20:1, with thw provisos that (a) when said copolyetherester contains less than 20% by weight of long chain ester units, the ratio of A:B is less than 1:2 or greater than 2:1 and (b) when said ethylene copolymer has a melting point not greater than 25°C., the ratio of A:B is not greater than 1:1.

3,963,803

ANTISTATIC ACRYLIC FIBER

Hiroyoshi Tanaka; Haruo Obara; Teruo Koseki; Hajime Machida; Michihiko Tanaka, and Shigeru Fujii, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sept. 24, 1973, Ser. No. 400,207

Claims priority, application Japan, Sept. 26, 1972, 47-95734; Mar. 8, 1973, 48-26623

Int. Cl.² C08G *39/10*

U.S. Cl. 260—873 **5 Claims**

1. An antistatic acrylic fiber consisting essentially of a polymer composition which comprises: (a) a polymer (A) consisting of polyacrylonitrile only or being a copolymer containing at least 60 mol % of acrylonitrile and at least one other copolymerizable monofunctional vinyl monomer selected from the group consisting of acrylic acid, methacrylic acid or alkyl substitutes, thereof; α-substituted, β-substituted and nucleus substituted styrene; vinyl carboxylates, vinyl chloride, vinylidene chloride, vinyl acetate, vinyl benzoate and vinyl chloroacetate; 2-vinyl pyridine and 2-methyl-5-vinyl pyridine or alkyl substitutes thereof; N,N-dimethylamino methyl methacrylate, N,N-diethylamino ethyl methacrylate, alkenyl aromatic sulfonic acid, vinyl sulfonic acid, allyl sulfonic acid, methallyl sulfonic acid and salts thereof, (b) a polymer (B) a majority of which consists of a polyether-polyester block copolymer consisting of about 60–95% by weight of a compound represented by the general formula (1) and about 5–40% by weight of a linear saturated polyester based on dibasic acids and dihydric alcohols

$$HO\left(CH_2CH_2O\right)_m-\left(CH_2\underset{CH_3}{CH}O\right)_n H \qquad (1)$$

(wherein each of m and n is 0 or a positive integer, but if one is zero the other is a positive integer, 25 $m+n$ 1000 and m 10), said linear saturated polyester being selected from the group consisting of polyethylene terephthalate, polyethylene adipate, polybutylene adipate, polybutylene terephthalate, polybutylene isophthalate, polyethylene azelate, polyethylene sebacate, polyethylene decandicarboxylate, polybutylene azelate, polybutylene sebacate, polyethylene terephthalate/adipate, polybutylene isophthalate/adipate, polyethylene adipate/azelate, polyethylene adipate/sebacate and polyethylene adipate/azelate/sebacate, said polymer composition containing about 0.3–10% by weight of said compound represented by the general formula (1), based on the total weight of the composition.

3,963,804

THERMOPLASTIC BLEND COMPOSITION

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio, Tokyo; Takanari Nawata, Tokyo; Masanobu Masu, Tokyo; Masaharu Kimura, Tokyo, and Norio Sayama, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 18, 1974, Ser. No. 462,177

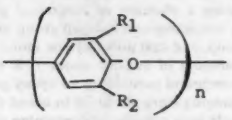
Claims priority, application Japan, Apr. 18, 1973, 48-43815

Int. Cl.² C08L *67/06; 260 873;876 R;876 B*

U.S. Cl. 260—873 **5 Claims**

1. In a thermoplastic blend composition having especially superior impact strength and fatigue resistance comprising

A. 15 to 80% by weight of a polyphenylene oxide having a polymeric structure expressed by the following formula



wherein R_1 and R_2 are the same or different, and each represents a methyl or ethyl group, and n is a positive integer of at least 85,

B. 16 to 75% by weight of a rubber-modified polystyrene having polymeric units of a conjugated diene monomer and polymeric units of an aromatic vinyl monomer, obtained by polymerizing the aromatic vinyl monomer in the presence of one member selected from the group consisting of a polymer of the conjugated diene monomer and a rubbery polymer which is a copolymer of the conjugated diene monomer and at least one monomer selected from the group consisting of ethylene, propylene, acrylonitrile and styrene, the content of said polymeric units of the conjugated diene monomer in the rubber-modified polystyrene being 2 to 15% by weight, and

C. 2 to 15% by weight of an aromatic polycarbonate, the improvement wherein the composition further comprises

D. 2 to 15% by weight of a high styrene rubber having polymeric units of a conjugated diene monomer and polymeric units of an aromatic vinyl monomer, obtained by copolymerizing the conjugated diene monomer and an aromatic vinyl monomer, the content of said polymeric units of the aromatic vinyl monomer in the high styrene rubber being 35 to 65% by weight,

the sum total of the proportions of the components (A), (B), (C) and (D) being 100% by weight.

3,963,805

WATER SWELLABLE POLY(ALKYLENE OXIDE)

Nan S. Chu, Hartsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 30, 1974, Ser. No. 519,268

Int. Cl.² C08L *71/02*

U.S. Cl. 260—874 **8 Claims**

1. A process for producing water swellable poly(alkylene oxide) which comprises introducing into a reaction zone an admixture of poly(alkylene oxide), having a molecular weight of at least 100,000 and an inert hydrocarbon solvent containing a free radical catalyst; adding to said reaction zone from 1% to 50% of acrylic acid, based on the weight of poly(alkylene oxide), the major portion to be added continuously, heating said reaction zone at a temperature within the range of 40°C to about 100°C for a time sufficient to produce said water swellable poly(alkylene oxide), and thereafter recovering said water swellable poly(alkylene oxide) from said reaction zone.

3,963,806
REACTION PRODUCT OF POLYALKYLENE IMINE AND EPOXY, HALO, ETHYLENIC SUBSTITUTED DIFUNCTIONAL COMPOUNDS

Ralph William Dornte, Lower Southampton Twp., Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed May 14, 1973, Ser. No. 359,990
The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.
Int. Cl.² C08L 39/04
U.S. Cl. 260—874 10 Claims

1. A resinous composition having a high degree of cross-linking to attain water insolubility which comprises the reaction product of a polyalkylene imine polymer and at least two polyfunctional cross-linking compounds, one of said cross-linking compounds containing an epoxy group and an ethylenic unsaturated group and another of said cross-linking compounds containing a plurality of functional groups selected from the group consisting of a halogen group and an ethylenic unsaturated group, and said polyalkylene imine polymer being present in an amount of at least about 15% by weight, said cross-linking compound containing an epoxy group is present in an amount ranging from about 20 to about 60% by weight, said other cross-linking compound containing either a halogen group, an ethylenically unsaturated group or both is present in an amount ranging from about 10 to about by 40% by weight.

3,963,807
POLYMERS OF ACRYLONITRILE AND AROMATIC OLEFINS WHICH CONTAIN GRAFTED RUBBER

King Lau Howe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 199,766, Nov. 17, 1971, Pat. No. 3,819,762. This application Nov. 6, 1972, Ser. No. 304,014
Int. Cl.³ C08L 51/04
U.S. Cl. 260—876 R 39 Claims

1. A polymer composition formed by the steps comprising

A. polymerizing acrylonitrile and an aromatic olefin selected from monomers consisting of styrene; 4-methyl styrene; 4-(t-butyl)-styrene; 3-methyl styrene; 2,4-dimethyl styrene; 2,6-dimethyl styrene and 2,4-diisopropyl styrene or α-methyl styrene in combination with said monomer in the presence of a free radical initiator, adding said olefin throughout said polymerization to a reaction medium containing acrylonitrile and said olefin to continuously maintain a ratio of said olefin to acrylonitrile in the reaction medium within 25 percent of the ratio required to produce a polymer containing an average composition selected from the range of 76 to 85 percent by weight acrylonitrile and 24 to 15 percent by weight of said olefin, said polymer having a melt viscosity of 10^4 to 10^6 poises at 220°C., and an inherent viscosity of 0.3 to 1.0 deciliter per gram as measured on a 0.5 gram per deciliter solution of the polymer in gamma-butyrolactone at 35°C.; and a carbon dioxide permeability of less than 0.02 barrer;

B. polymerizing 30 to 50 percent by weight of a graft polymer consisting essentially of 61 to 85 percent by weight acrylonitrile polymerized units and 39 to 15 percent polymerized units of at least one aromatic olefin selected from monomers consisting of styrene; 4-methyl styrene; 4-(t-butyl)-styrene; 3-methyl styrene; 2,4-dimethyl styrene; 2,6-dimethyl styrene and 2,4-diisopropyl styrene or α-methyl styrene in combination with said monomer with 50 to 70 percent by weight rubber, with the acrylonitrile portion of the graft polymer in (B) being no more than 15 percent absolute by weight less than the acrylonitrile content of (A);

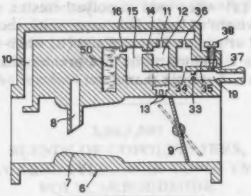
C. blending 65 to 99 percent by weight of the polymer of (A) with 1 to 35 percent by weight of polymer (B); and

D. recovering a polymer having a carbon dioxide permeability of less than 0.045 barrer.

3,963,808
CARBURETORS FOR INTERNAL COMBUSTION ENGINES

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Dec. 13, 1973, Ser. No. 424,608
Claims priority, application Italy, Dec. 15, 1972, 33018/72
Int. Cl.² F02M 3/00
U.S. Cl. 261—41 D 2 Claims

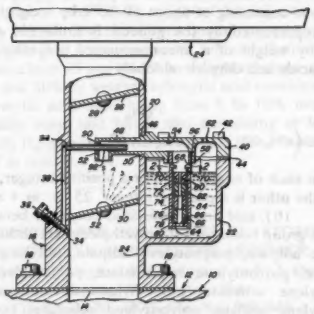


1. An internal combustion engine, in which the air-fuel mixture is produced in a carburetor and introduced through an intake duct to each induction valve opening into each explosion chamber, said carburetor comprising at least a passage port for the feeding fluid; a butterfly throttling valve for controlling said passage port for the feeding fluid; at least a first premixing chamber communicating through calibrated ports with a fuel induction duct and with a cavity, said cavity communicating with the atmosphere through a calibrated port and with the intake duct through at least a progression passageway, said progression passageway opening in the vicinity of the edge of said throttle, so as to be upstream of the edge when the throttle is in its minimum opening position, and downstream of the edge when the throttle is partially open, said premixing chamber being connected by an auxiliary duct to said intake duct downstream of said carburetor, said first premixing chamber being connected to said auxiliary duct through a restricted passageway, and including further a compensation chamber communicating through calibrated ports with said first chamber, with the atmosphere and with said auxiliary duct downstream of the restricted passageway.

3,963,809
VACUUM CONTROLLED FUEL METERING DEVICE

Alois Steiner, 250 Sixth Ave., St. Petersburg, Fla. 33701

Filed Dec. 1, 1975, Ser. No. 636,430
Int. Cl.² F02M 7/04
U.S. Cl. 261—69 R 6 Claims



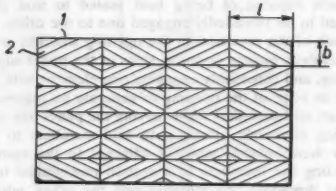
1. In combination with a carburetor body of the type including a tubular portion defining an air and fuel mixture passage extending through said body, said body defining a float chamber along one side of said passage, a fuel delivery passage communicated at one end with the interior of the fuel cham-

ber above the fuel level therein and at the other end with the interior of said mixture passage, an upstanding body in said chamber defining an upstanding fluid passage therethrough whose upper end is in sealed communication with the inlet end of said delivery passage and whose lower end opens outwardly into said chamber below the fuel level therein, said fluid passage being provided with a centrally apertured seat in its lower end, a plurality of vertically stacked pressure differential and fluid dynamic pressure valve members disposed in said fluid passage for free independent reciprocation therein between upper limit positions and lower limit positions defined by seated engagement of the lowest valve member with said seat and each valve member with the valve member immediately therebelow, said valve members having vertical bores formed therethrough aligned with each other and the aperture in said seat, said valve members each including peripherally spaced outer side guide surface portions spaced further radially outwardly from the corresponding bore than the remaining outer side surfaces of said valve members for guiding engagement with the inner surfaces of said fluid passages and for minimum surface to surface guiding contact between said valve members and the inner surfaces of said fluid passage.

3,963,810
CONTACT BODY FOR COOLING TOWERS

Roy Holmberg, and Ove Strindehag, both of Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Dec. 16, 1974, Ser. No. 533,227
Claims priority, application Sweden, Dec. 20, 1973, 7317317
Int. Cl.² B01D *47/00*
U.S. Cl. 261—112 **11 Claims**

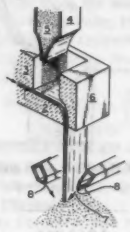


1. A contact body for water and air, comprising a plurality of contact plates, which stand vertically in parallel and are provided with folds or corrugations constituting a so-called fine structure with a fold height of 1 to 5 mm and a wave length of the folds below 12 mm, characterized in that each contact plate shows a plurality of fine-structured fields both along its extension in the horizontal direction and along its extension in vertical direction, in each field the folds being parallel relative to each other, the folds for two adjacent fine-structured fields both horizontally and vertically having opposite inclination to the vertical plane, the folds in said fields forming an angle to the vertical plane of between 65° and 88° for obtaining a good adhesion and favorable distribution of the water thereby that the surface tension force acting upon the liquid agrees in magnitude closely with the gravity force acting on the liquid.

3,963,811
PROCESS FOR PRODUCING A COMPOSITE METAL POWDER

Kiyoshi Tamura, Kawasaki, and Tohru Takeda, Sagamihara, both of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 14, 1974, Ser. No. 451,047
Claims priority, application Japan, June 4, 1973, 48-61867
Int. Cl.² B01J *2/02*
U.S. Cl. 264—7 **5 Claims**



1. A process for producing a composite metal powder comprising a nucleus of a first metal and a coating of a second metal, said process comprising

a. mixing powder having a particle size not greater than 200 mesh of a first metal with a melt of a second metal, said metal having a temperature lower than the melting point of said metal powder, the amount of powder to melt by volume not exceeding 50%,

b. flowing as a continuous stream the resulting molten mixture of said first and second metals,

c. jetting a stream of a fluid against said continuous stream of molten mixture at a rate of 30 to 200 meters per second to atomize said continuous stream of molten mixture into fine particles, and

d. cooling and solidifying the resulting fine particles to thereby obtain a composite metal powder in which the surfaces of the particles of said first metal, as the nucleus, are coated with said originally molten second metal.

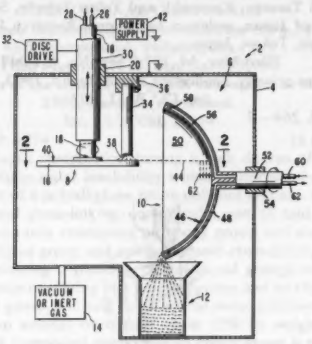
3,963,812
METHOD AND APPARATUS FOR MAKING HIGH PURITY METALLIC POWDER

Max P. Schlienger, San Rafael, Calif., assignor to Schlienger, Inc., San Rafael, Calif.

Filed Jan. 30, 1975, Ser. No. 545,635
Int. Cl.² B22D *23/08*
U.S. Cl. 264—8 **20 Claims**

1. A method for powderizing a solid metal object having a first transverse dimension comprising the steps of: rotating a disc electrode, the electrode having a second transverse dimension parallel to the first dimension which is substantially larger than the first transverse dimension; positioning the object between the axis of rotation of the electrode and a periphery thereof in close proximity with the electrode; applying an electrical potential between the object and the disc to form an arc and melt portions of the object proximate the disc; whereby molten metal droplets drop onto the disc and such droplets are thrown off the disc by centrifugal forces; impinging thrown off metal droplets on a surface having a temperature substantially less than the temperature of the molten droplets so that the droplets solidify without adhering to each

other and to the surface; moving the surface in a direction generally transverse to the direction in which the molten



droplets are thrown off the disc; and collecting the solidified droplets.

3,963,813

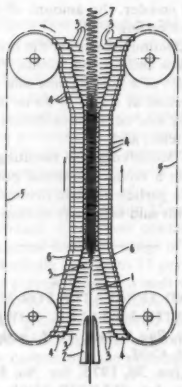
CUSPATED SHEET FORMING

Donald George Keith, Mount Eliza, Australia, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 536,291, Dec. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 307,211, Nov. 16, 1972, abandoned. This application May 12, 1975, Ser. No. 576,782

Int. Cl.[2] B29B *3/02*; B29C *17/03*

U.S. Cl. 264—167 9 Claims



1. A forming process of manufacturing an unperforated cuspated sheet comprising deforming a sheet of melt spinnable thermoplastic material by pressing against one face of a hot sheet of the material the cold outer tips of a first array of pointed pins and simultaneously pressing against the second face of the material the cold outer tips of a second array of projections so that the arrays interpenetrate in such a manner that the projections are spaced from the pins by a distance greater than the thickness of the sheet, thereby deforming the sheet so as to exhibit a plurality of hollow cusps having tips and side walls, the initial temperature of the hot sheet being in the range between the melting point of the thermoplastic material and the temperature at which the material becomes unworkable, the initial temperature of the tips of the arrays being less than the melting point of the thermoplastic material and the speed of interpenetration of the arrays being in the range above the speed at which the tips of the cusps of the product are punctured and below the speed at which the side walls of the cusps of the product are perforated, and subsequently withdrawing the pins and projections from the sheet.

3,963,814

METHOD FOR HERMETICALLY SEALING A RIGID PANEL

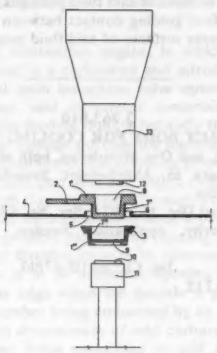
Jean Cospen, Cachan, and Bernard Baumann, Paris, both of France, assignors to Cebal GP, France

Continuation of Ser. No. 256,308, May 24, 1972, abandoned, which is a division of Ser. No. 110,964, Jan. 29, 1971, Pat. No. 3,713,956. This application June 23, 1975, Ser. No. 589,197

Claims priority, application France, Feb. 6, 1970, 70.04278

Int. Cl.[2] B29C *27/00*

U.S. Cl. 264—23 5 Claims



1. A method for hermetically sealing an opening in a panel, said panel being substantially rigid but capable of vibrating, comprising the steps of providing a pair of thermoplastic members capable of being heat sealed to said panel and adapted to be threadedly engaged one to the other, positioning each of the members in the opening whereby portions of the members engage opposite sides of the panel adjacent the opening, and threadably engaging one element with the other about an edge of the opening to generate an internal tension between said members while leaving the panel free to vibrate, applying ultrasonic vibration to said members to heat and soften thermoplastic material adjacent to the opening, and subjecting the members to a second mechanical tension by further threading one member into the other, whereby the members are heat sealed to the panel adjacent to the opening while leaving threads of said members free from located fusion.

3,963,815

METHOD OF LINING MOLTEN METAL VESSELS AND SPOUTS WITH REFRACTORIES

Toshiyuki Ezaki; Kunio Furukawa, both of Kagogawa, and Yasushige Enomoto, Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Harima Refractory Co., Ltd., both of, Japan

Continuation of Ser. No. 269,425, July 6, 1972, abandoned. This application June 20, 1974, Ser. No. 481,319

Claims priority, application Japan, July 10, 1971, 46-51263

Int. Cl.[2] F27D *1/16*

U.S. Cl. 264—30 1 Claim

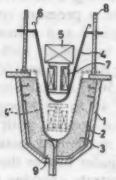
1. A method for lining metal vessels and spouts to be used for molten metals with refractories comprising the steps of:

A. introducing a particulate refractory material composed of 30% to 70% by weight of aggregate particles having a

grain size from 1 to 8 mm and 70% to 30% by weight of matrix particles not larger than 1 mm into the spout or vessel;

B. placing a molding frame having a desired lining profile on the refractory material;

C. subjecting the refractory material to vibration of a frequency from 1500 to 9000 v.p.m. and an amplitude of 0.2 to 3.0 mm to place the refractory in a fluidic state; and



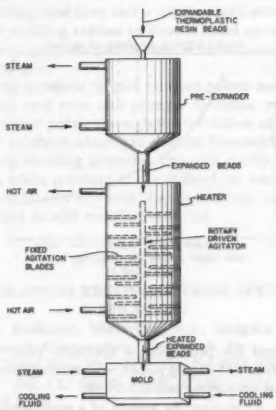
D. applying a load of 1.5 to 12 tons per cubic meter based on the volume of the molding frame to the molding frame during said vibration whereby the molding frame settles to a predetermined position to displace a portion of the refractory material which fills the space thus created between the side of the vessel or spout and the molding frame and forms a homogeneous and dense lining.

3,963,816

PROCESS FOR MOLDING EXPANDABLE THERMOPLASTIC MATERIAL

Stuart B. Smith, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Filed Sept. 2, 1971, Ser. No. 177,476
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—53 **11 Claims**



1. A method of preparing expanded, shaped thermoplastic articles comprising:

a. pre-expanding, by means of live steam, a synthetic thermoplastic resin in bead form containing an expanding agent having a boiling point of above 15° – 100° C. to a density of about 0.05 to 40 lbs. per cubic foot, the steam contacting the particles and resulting normally in some wetting of the resulting pre-expanded beads;

b. heating the pre-expanded beads, by means of hot substantially dry gas to a temperature above both the boiling point of the expanding agent and above the softening temperature of the thermoplastic resin beads but below the fusion temperature of the thermoplastic resin beads for a period of time sufficient to remove substantially all the moisture from the surfaces of the beads, the beads being substantially continuously agitated during any period of time during the hot gas heating period when the beads are heated to a temperature above their softening temperature;

c. transferring the heated pre-expanded beads into a closed mold;

d. forming a shaped article from the beads by heating them to at least their fusion temperature causing said beads to expand and fuse together; and

e. cooling the shaped articles to a temperature below the softening temperature of the thermoplastic material and removing the article from the mold;

the temperature of the beads being continuously maintained above the boiling point of the expanding agent from the time the beads are pre-expanded to the time they are expanded to form the shaped article.

3,963,817

SYSTEM FOR REHYDRATION OF CURING OF SHAPED ACTIVATED GREEN CERAMIC STRUCTURES

Marlyn D. Ballain, Belleville, Ill., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed July 11, 1974, Ser. No. 487,642
Int. Cl. C04b *35/10*
U.S. Cl. 264—56 **4 Claims**

MOLD GREEN CERAMIC MATERIAL INTO DESIRED SHAPE
IMMERSE GREEN CERAMIC MATERIAL IN NON-SOLVENT LIQUID AT 50–100°C FOR 2–16 HOURS
REMOVE GREEN CERAMIC MATERIAL, DRY, AND FIRE

1. A system for rehydration of an activated green ceramic material capable of preventing cracking or premature drying of green ceramic material which has been previously extruded into a thin-wall structure comprising immersing the green ceramic material into a fluid bath maintained at a temperature of 50°–100°C comprising a liquid wherein the specific gravity of the liquid is less than that of said green ceramic material so as to allow immersion of said green ceramic material in said liquid and further such that said material will not rise above the surface of said liquid and which is not a solvent for any ingredients in said green ceramic material for a period of from 2–16 hours to thereby permit controlled rehydration of the green ceramic without injury to the structure thereof.

3,963,818

WATER SOLUBLE CORE FOR PRESSURE DIE CASTING AND PROCESS FOR MAKING THE SAME

Tadami Sakoda, and Tetsuhiko Suzuki, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Continuation of Ser. No. 193,983, Oct. 29, 1971, abandoned.
This application Mar. 27, 1974, Ser. No. 455,091
Int. Cl. C04b *35/64;* **B29c** *1/02*
U.S. Cl. 264—56 **2 Claims**

1. A process for preparing a water-soluble core to act as a cavity former in a pressure die casting process which comprises the steps of:

1. preparing an inorganic water-soluble salt consisting predominantly of sodium chloride or potassium chloride and having a grain size of 40 to 100 American Foundary

Standard Grain Fineness Number, said salt containing a moisture content of less than 1% in weight,

2. placing said salt from step 1 in a mold,
3. compressing said salt with a pressure between 1.8 and 4.0 tons per cm^2, and
4. removing the completed core from the mold, thereby obtaining a core characterized by a bending strength of between 200 and 230 Kg/cm^2 for use as a cavity former in a pressure die casting process.

3,963,819
METHOD OF PREPARING COLORED FIBROUS SHEET MATERIALS

Karl Kristian Kobs Kroyer, Vestre Kongevej 80, 8260 Viby J., and Torben Borup Rasmussen, Tousvej 18, 8230 Abyhoj, both of Denmark

Continuation of Ser. No. 57,325, July 22, 1970, abandoned. This application July 20, 1973, Ser. No. 380,980
Int. Cl.² D06P 7/00
U.S. Cl. 264—78 **13 Claims**

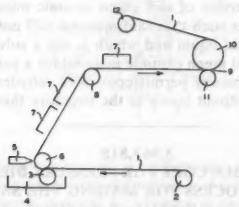
1. A method of preparing a colored fibrous sheet from an organic fiber pulp, comprising:

a. introducing an organic fiber pulp into a defibrator to form the pulp into individual fibers,
b. introducing into the defibrator an amount of dye material selected from the group consisting of dry dyes and dye solutions, the amount being sufficient to impart a desired color to the individual fibers, wherein the amount of solvent in the dye solution is less than that which would render the formed fibers tacky and cause adherence of the fibers to one another as well as to the walls and moving parts of the defibrator,
c. contacting the organic fiber pulp with the dye material to dye all individual fibers,
d. suspending the dyed fibers in a formed gaseous stream and passing the stream through a gas-permeable forming surface to form a fibrous layer wherein the dye is uniformly distributed,
e. incorporating a binder into the fibrous layer, and
f. binding the fibers of the layer into a colored fibrous sheet.

3,963,820
COATED SUBSTRATES PRODUCTION

Rene C. Blakey, Preston, England, assignor to Star Paper Limited, Feniscowles, Blackburn, England

Continuation-in-part of Ser. No. 337,239, March 1, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,684
Int. Cl.² B29D 9/02
U.S. Cl. 264—134 **11 Claims**

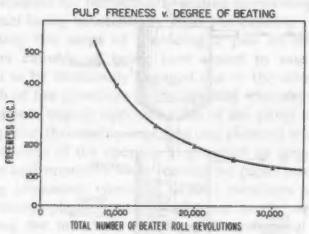


1. A continuous process for making a cast coated high gloss moulded polymeric coating on a permeable sheet substrate selected from the group consisting of paper and paperboard, which comprises the following sequential steps (a) applying to the substrate an aqueous coating comprising an aqueous emulsion or dispersion of a polymeric material having a second order transition temperature below 40°C selected from the group consisting of polyvinyl acetate, polyvinylidene chloride, copolymers of vinyl chloride and vinyl acetate, polystyrene copolymers, polyurethanes, polyacrylates, polymethacrylates, polyacrylonitriles, polyamides and polyethylene, (b) heating the aqueous coating without application of pressure to a temperature above the film-forming temperature of the polymeric material by passage through a drying zone, and thereby forming a continuous film of the polymeric material in the presence of water and subsequently evaporating water until the moisture content of the coated substrate is from 8 to 18%, based on the weight of substrate, (c) moulding the film by passing the coated substrate having a moisture content of 8 to 18% through a nip between a pressure roll exerting a moulding pressure above 10 kg/cm^2 and a heated polished moulding cylinder with the film in contact with the moulding cylinder, the moulding cylinder having a moulding temperature which is between 105° and 150°C and at which the polymeric material has a viscosity of 40 to 80 Mooney viscosity units, and maintaining the film in contact with the moulding cylinder without any relative movement between the film and the cylinder while the cylinder moves through 45° to 270°C and (d) separating the substrate carrying the resultant high gloss moulded polymeric coating from the cylinder.

3,963,821
METHOD FOR PRODUCING SYNTHETIC FIBER FOR PAPER

Hiromu Takeda; Takuichi Kobayashi; Koichiro Oka, all of Otsu, and Kazumi Tanaka, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 488,486, July 15, 1974. This application Nov. 4, 1974, Ser. No. 520,538
Claims priority, application Japan, July 19, 1973, 48-80469; July 26, 1973, 48-83609; Aug. 2, 1973, 48-86384
Int. Cl.² B29H 7/18
U.S. Cl. 264—147 **5 Claims**



1. A method for producing a synthetic fiber capable of being fibrillated for forming paper, which comprises dissolving a composition consisting essentially of:

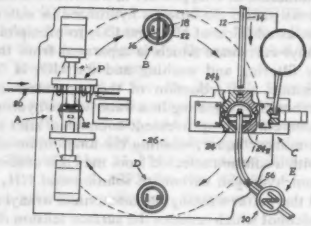
A. about 5–40 percent by weight of a graft copolymer consisting of
   a. about 20–80 percent by weight of polyvinyl alcohol having an average degree of polymerization of about 500–3400 chemically bonded to
   b. about 80–20 percent by weight of acrylonitrile, and
B. about 60–95 percent by weight of a copolymer consisting of
   c. about 55–95 percent by weight of styrene, and
   d. about 5–45 percent by weight of acrylonitrile at a concentration of about 8–40 percent by weight, based upon the weight of the solvent, in a solvent selected from the group consisting of dimethyl sulfoxide and dimethyl acetamide, and wet spinning the resulting solution into an aqueous spinning bath.

3,963,822

METHOD OF MOLDING ELECTRICAL LAMP SOCKETS

Henry T. Beck, Toronto, and Rudolph Koehler, Willowdale, both of Canada, assignors to Noma Lites Canada Limited, Scarborough, Canada

Filed Sept. 12, 1969, Ser. No. 857,452
Int. Cl.² B29D 3/00
U.S. Cl. 264—251 4 Claims



1. A method of molding lamp sockets onto paired insulated conductors comprising the steps of:

a. assembling at a first work station a pair of pointed electrical lamp contacts on a core member, said contacts being in spaced relation and having their points exposed, with margins of said contacts, when so assembled on said core, extending from said core,

b. transferring said core member with said contacts thereon to a molding station.

c. orienting in said molding station said pair of insulated conductors in a position to be penetrated by the contact points,

d. assembling said core and a plunger with other mold parts at said molding station to form a mold cavity into which said core projects and which is subsequently sealed by said plunger,

e. applying pressure to said contact points and conductors between said core and plunger to cause penetration of said contact points through the insulation of said conductors to establish electrical contact therewith, and

f. injecting molding material into said cavity to form said socket while pressure is maintained on said conductors, said conductors and said margins of said contacts being imbedded in said molding material.

3,963,823

MOLYBDENUM RECOVERY FROM SPENT ACID SOLUTION

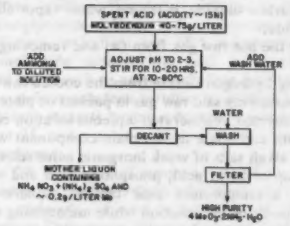
Avinash D. Kulkarni, Montclair, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1975, Ser. No. 552,835
Int. Cl.² C01G 39/00; C22B 34/34
U.S. Cl. 423—56 3 Claims

1. The method of recovering molybdenum in a form substantially free from other metals from a mixed sulfuric acid-nitric acid aqueous solution having substantial quantities of molybdenum dissolved therein, and which mixed acid solution has been used to dissolve molybdenum mandrels from coiled tungsten filaments, which method comprises:

a. adding sufficient ammonium hydroxide to said acidic solution to partially neutralize same and raise the pH thereof to a value of from about 1.5 to about 3;

b. agitating the resulting partially neutralized solution while maintaining same in a heated condition at a temperature less than about 95°C, and maintaining said solution agitation and said solution heated condition for a predetermined period of time sufficient to precipitate therefrom substantially all dissolved molybdenum as ammonium molybdate complex; and



c. separating the resulting precipitate from residual solution.

3,963,824

PROCESS FOR EXTRACTING CHROMIUM FROM CHROMIUM ORES

Roland Bachelard, Lyon, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 362,677, May 22, 1973. This application June 10, 1975, Ser. No. 585,812
Claims priority, application France, June 14, 1972, 72.21356
Int. Cl.² C01G 37/14
U.S. Cl. 423—61 9 Claims

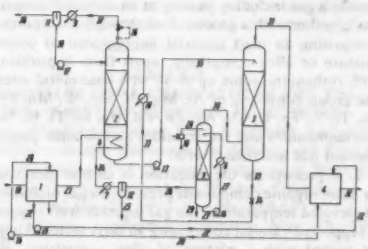
1. A process for extracting chromium in the form of a chromate from ore or concentrate by the suspension oxidation thereof to the chromate state which comprises suspending finely crushed ore or concentrate containing the chromium in a molten liquid bed of an alkali metal salt in the ratio of 1 part by weight of ore to 5 to 20 parts by weight of salt; subjecting the suspension to agitation with an oxygen-containing gas at a temperature and for a time sufficient to convert the chromium to alkali metal chromates; and leaching with water to separate out the water soluble chromates from insoluble residue.

3,963,825

PROCESS OF DESULFURIZING HOT GASES

Karl Bratzler, Bad Homburg; Alexander Doerges, Frankfurt am Main; Georg Kempf, Schoneck; Paul Rudolph, Bad Homburg, and Johann Schlauer, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 23, 1972, Ser. No. 265,057
Claims priority, application Germany, June 4, 1971, 2127768
Int. Cl.² B01D 53/34
U.S. Cl. 423—223 9 Claims



1. Process for selectively desulfurizing gases which comprises:

a. reacting liquid or solid carbonaceous fuels with oxygen-containing gases and water vapor under pressure to produce a hot raw gas under superatmospheric pressure, said raw gas substantially containing hydrogen, carbon monoxide, carbon dioxide, methane, water vapor and hydrogen sulfide;

b. cooling the hot raw gas from (a) and removing condensate;

c. removing hydrogen sulfide from the cooled raw gas from (b) by scrubbing said raw gas in packed or plate columns with a recycled, regenerated aqueous solution containing potassium carbonate as the main component with additives of alkali salts of weak inorganic acids selected from the group of boric acid, phosphoric acid and vanadium acid at a temperature near the atmospheric-pressure boiling point of the solution while maintaining a volume ratio of from 0.2 to 2.0 cubic meters of said solution per standard cubic meter hydrogen sulfide in the raw gas from (b);

d. regenerating aqueous scrubbing solution from (c) by heating; and

e. recycling regenerated solution from (d) to step (c).

3,963,826
LOW TEMPERATURE, LOW PRESSURE HYDROGEN GETTERING

D. Richard Anderson; Robert L. Courtney, and Larry A. Harrah, all of, Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 443,077, Feb. 15, 1974, Pat. No. 2,896,042. This application Mar. 21, 1975, Ser. No. 560,846
Int. Cl.² C01B *1/26*; B01J *1/14*
U.S. Cl. 423—248 **9 Claims**

1. In the method of gettering hydrogen and its isotopes including deuterium and tritium, by preparing a hydrogen getter which comprises coating a hydrogenation catalyst selected from the group of metals consisting of group VIII of the periodic table and alloys thereof with an active unsaturated organic material taken from the group consisting of dimerized propargyl phenyl ether, dimerized benzylacetylene, dimerized phenylpropiolate, dimerized biphenyl propargyl ether and polydipropargyl ether of bisphenol-A polymer.

3,963,827
CATALYSIS

Gary James Keith Acres, and Barry John Cooper, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Oct. 26, 1972, Ser. No. 300,980
Claims priority, application United Kingdom, Oct. 28, 1971, 50144/71; Oct. 28, 1971, 50145/71
Int. Cl.² B01D *53/34*
U.S. Cl. 423—239 **37 Claims**

1. A process for the reduction of an oxide of nitrogen present in a gas including passing at an elevated temperature the gas together with a gaseous fuel through a supported catalyst comprising an inert material impregnated or coated with a mixture or alloy comprising, apart from impurities, 5 to 75 wt% ruthenium, some up to 30 wt% base metal selected from the group consisting of Al, Mg, Cr, Mo, W, Mn, Fe, Re, Co, Ni, Ti, V, Th, U, Cu, Ag, Zn, Cd, Hg, In, Tl, Bi, Sn, Pb, Sb, the lanthanides and the actinides and balance platinum in an amount not less than 5 wt%.

2. A process for the oxidation of carbon monoxide or one or more organic compounds present in a gas including passing, at elevated temperature, the gas together with oxygen through a supported catalyst comprising an inert material impregnated or coated with a mixture of alloy comprising, apart from impurities, 5 to 75 wt% ruthenium, some up to 30 wt% base metal selected from the group consisting of Al, Mg, Cr, Mo, W, Mn, Fe, Re, Co, Ni, Ti, V, Th, U, Cu, Ag, Zn, Cd, Hg, In, Tl, Bi, Sn, Pb, Sb, the lanthanides and the actinides and balance platinum in an amount not less than 5 wt%.

3,963,828
MANUFACTURE OF URANIUM DIOXIDE POWDER

Manfred Becker, Eichenhain, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 6, 1973, Ser. No. 394,861
Int. Cl.² C01G *43/02*
U.S. Cl. 423—261 **3 Claims**

1. Manufacture of UO_2 powder in which UF_6 is transformed into gaseous phase, the latter is hydrolized in water with the simultaneous addition of NH_3 and CO_2 to precipitate ammonium uranyl carbonate which is separated from the mother liquor by filtering and washing and the UO_2 is formed by decomposition and reduction of the separated ammonium uranyl carbonate by heating in a water vapor/hydrogen atmosphere; wherein the improvement comprises, after separation from the mother liquor, washing the ammonium uranyl carbonate with a solution selected from the class consisting of an ammonium hydrogen carbonate solution and NH_4OH solution, and thereafter washing the ammonium uranyl carbonate with an alcohol which reduces the surface tension of its residual water.

3,963,829
RARE EARTH MANGANESE SILICIDES

Vancliff Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 12, 1974, Ser. No. 488,236
Int. Cl.² C01F *17/00*; C01B *33/00*
U.S. Cl. 423—263 **8 Claims**

1. A ferromagnetic compound having the formula $GdMn_{1-x}Fe_xSi$ or LnMnSi wherein $0<x \leq 0.5$ and Ln is at least one of Gd, La or Y characterized by a tetragonal Cu_2Sb-type crystal structure and a Curie temperature in the range of about 275°-330°K.

2. A compound of claim 1 having the formula $GdMn_{1-x}Fe_xSi$.

3. A compound of claim 1 having the formula LnMnSi.

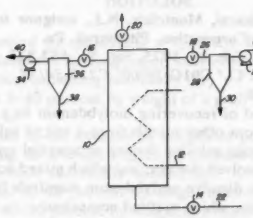
4. A compound of claim 3 wherein Ln is Gd.

5. A compound of claim 3 wherein Ln is La.

3,963,830
THERMOLYSIS OF WATER IN CONTACT WITH ZEOLITE MASSES

Paul Haruo Kasai, White Plains, and Roland Justin Bishop, Jr., Hauppage, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 16, 1975, Ser. No. 587,387
Int. Cl.² C01B *13/00*
U.S. Cl. 423—579 **6 Claims**



1. Process for producing oxygen which comprises providing a closed reaction zone containing a three-dimensional crystalline zeolitic molecular sieve having pore diameters large enough to adsorb oxygen, said zeolite containing as nonframework structural members, trivalent metal cations having a standard electrode reduction potential more positive than

−2.0, said molecular sieve containing insufficient water of hydration to stabilize the said trivalent metal cations against reaction with water, and contacting said zeolite at a temperature of at least 200°C. up to the crystal destruction temperature of the zeolite with water molecules whereby the trivalent metal cations are reduced and oxygen is evolved, and collecting the evolved oxygen.

3,963,831

PROCESS FOR THE MANUFACTURE OF ALKALI METAL HYDRIDES IN COARSE POWDER FORM

Arnold Lenz, Cologne-Stammheim, and Walter Rogler, Bonn, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation-in-part of Ser. No. 263,071, June 15, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 57,415, June 16, 1970, abandoned, and Ser. No. 202,654, Nov. 26, 1971, Pat. No. 3,919,405, which is a continuation-in-part of Ser. No. 730,942, May 21, 1968, abandoned. This application Dec. 5, 1973, Ser. No. 422,057

Claims priority, application Germany, Aug. 14, 1973, 2340997

Int. Cl.² C01B 6/04

U.S. Cl. 423—646 **15 Claims**

1. In a process for the continuous preparation of an alkali metal hydride which process comprises continuously reacting a liquid alkali metal with hydrogen in the presence of pre-introduced alkali metal hydride, the improvement which comprises employing the hydrogen and alkali metal reactants and the pre-introduced and formed alkali metal hydride as the sole constituents of the reaction mixture, introducing substantially stoichiometric quantities of liquid alkali metal and hydrogen into a closed reaction vessel in amounts per unit time no larger than the corresponding amount of alkali metal hydride formed in such unit time, the hydrogen pressure in said reaction vessel being between 2 and 10 atmospheres gauge, agitating the vessel contents, and maintaining an alkali metal concentration of not more than 3 percent by weight, based on the alkali metal hydride present in the reactor, to produce alkali metal hydride in colorless coarsely crystalline powder form of 100 to 1000 micron average particle size, the particles having a layer-like and non-porous compact structure and being non-self-igniting in air.

14. Process as claimed in claim 1 wherein said alkali metal hydride produced in coarsely crystalline powder form is ground to approximately 10 to 15μ in a hydrocarbon mixture of a high-boiling liquid saturated hydrocarbon boiling in the range of about 220°C to 400°C and a lower boiling hydrocarbon boiling in the range of 20°C to 160°C, to form a finely granular alkali metal hydride, the amount of the high-boiling hydrocarbon in grams per gram of alkali metal hydride being 2.5 divided by the ground particle size in microns, and thereafter removing said lower boiling hydrocarbon.

3,963,832

LIQUID OR PASTY DENTIFRICE AND PROCESS FOR ITS PREPARATION

Shigeru Hashimoto, Sulta; Eizi Ninomiya, Tokyo, and Junko Kuroda, Kyoto, all of Japan, assignors to Teijin Limited and Sunstar Dentifrice Co., Ltd., both of Osaka, Japan

Continuation-in-part of Ser. No. 435,184, Jan. 21, 1974, abandoned. This application July 24, 1975, Ser. No. 598,846

Claims priority, application Japan, Jan. 24, 1973, 48-9447

Int. Cl.² A61K 7/16, 7/26

U.S. Cl. 424—56 **2 Claims**

1. A liquid putrefaction resistant thixotropic gel dentifrice that is stable against phase separation of solid abrasive dentifrice particle ingredients which essentially consists of:

25 to 35% by weight of water,

20 to 35% by weight of humectants, selected from the group consisting of glycerol, sorbitol, maltitol, glucose, propylene glycol, polyethylene glycol and sodium pyrrolidone carboxylate,

0.5 to 2% by weight of a member selected from the group consisting of sodium lauryl sulfate, sodium N-lauroyl sarcosinate, α-olefin sulfonate, sodium 2-hydroxyalkyl sulfate, sodium laurylether sulfate, sodium coconut monoglyceride sulfate, sodium coconut monoglyceride sulfonate, a sodium salt of a monoester of lauroylethanolamide sulfosuccinic acid, polyoxyethylene fatty acid esters such as polyoxyethylene sorbitan monopalmitate, polyoxyethylene sorbitan monostearate, or polyoxyethylene stearate having a degree of polymerization of at least 25, and a polyoxyethylene polyoxypropylene block copolymer,

0.3 to 2% by weight of a polysaccharide having a number average molecular weight of not less than 100,000 and the molecule of said polysaccharide containing D-glucose, D-mannose, D-galactose and D-glucuronic acid in the molar ratio of about 3:3:1:2, and

20 to 35% by weight of solid particles of abrasives, selected from the group consisting of dicalcium phosphate dihydrate, calcium pyrophosphate, anhydrous dicalcium phosphate, insoluble sodium methaphosphate, hydrated alumina, calcium carbonate, magnesium carbonate, magnesium oxide, and silica, whereby said thixotropic gel dentifrice flows easily under low pressure and with good flowability, and when extruded loses its flowability upon removal of extrusion pressure while retaining the shape as extruded.

3,963,833

ANTIPERSPIRANT COMPOSITION AND METHOD CONTAINING A DIHYDRO-BENZOFURAN AND AN ASTRINGENT METAL SALT

Salvatore Joseph DeSalva, Somerset, and Christopher H. Costello, Millington, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 262,146, June 2, 1972, which is a continuation-in-part of Ser. No. 106,587, Jan. 14, 1971, Pat. No. 3,775,538. This application June 27, 1974, Ser. No. 483,792

Int. Cl.² A61K 7/34, 7/36, 7/38

U.S. Cl. 424—68 **16 Claims**

1. An antiperspirant composition comprising 3-phenyl-3-carbo-(di-lower alkylamino)-lower alkoxy-2,3-dihydrobenzofuran or a salt thereof selected from the group consisting of hydrohalic, sulfuric, sulfurous, acetic, phosphoric, boric, nitric, lactic, gluconic, and carbonic acid salts and mixtures thereof, and an antiperspirant metal salt selected from the group consisting of aluminum chlorhydrate, aluminum chloride, aluminum sulfate, aluminum sulfamate, aluminum sulfonate, zinc phenolsulfonate, zinc sulfate, zinc chloride, zirconium oxychloride, zirconium chloride, zirconium sulfate, alkaline earth metal chloride, and alkaline earth metal sulfate and mixtures thereof, in which the proportion of the 3-phenyl-3-carbo-(di-lower alkylamino)-lower alkoxy-2,3-dihydrobenzofuran compound to the antiperspirant metal salt is from 1:2 to 1:50 and wherein the total of said dihydrobenzofuran compound and said antiperspirant metal salt in the composition is from 1 to 50%, and the balance being a cosmetic vehicle.

3,963,834

PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF HYDROPIC CONDITIONS

Rolf Kuhn, Manheim-Waldhof; Klaus Hardebeck, Ludwigshafen (Rhine); Helmut Henemann, Heidelberg, and Knut Osmers, Viernheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldorf, Germany

Filed Apr. 18, 1975, Ser. No. 569,635

Claims priority, application Germany, May 15, 1974, 2423550

Int. Cl.² A61K 31/56

U.S. Cl. 424—240 **24 Claims**

1. A pharmaceutical composition for treating hydropic conditions, comprising diuretically effective amounts of

a. at least one member of the group consisting of 5-(4-chloro-5-sulfamoyl-2-thenylaminophenyl)-tetrazole and the pharmacologically compatible salts thereof

b. at least one member of the group consisting of 3-(3-oxo-17β-hydroxy-4,6-androstadien-17β-yl)-propionic acid-γ-lactone and the pharmacologically compatible salts of 3-(3-oxo-17β-hydroxy-4,6-androstadien-17α-yl)-propionic acid,

and a pharmaceutically acceptable carrier.

3,963,835

FERMENTED FLOUR AND METHOD OF PREPARATION

Alfred J. Gryczka, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Continuation of Ser. No. 438,749, Feb. 1, 1974, abandoned. This application Apr. 24, 1975, Ser. No. 571,232

Int. Cl.² A23L *1/10*; A21D *2/08*; A23L *1/23*

U.S. Cl. 426—18 5 Claims

1. The method for fermenting sugars in flour to provide an acid flour which comprises:

a. fermenting at a temperature between about 21.1°C and 45°C for between about 12 to 24 hours a mixture of a flour selected from rye and wheat flours and water with a concentrate of a non-toxic *Lactobacillus* which has been cultured while maintaining the pH between about 5.0 and 6.0 to produce a concentration of at least about 1×10^8 cells per ml as a single species of *Lactobacillus* before being mixed in the flour and allowing the fermentation mixture pH to drop due to the formation of lactic acid and acetic acid from the sugars in the fermentation mixture; and

b. drying the fermentation mixture in air at a temperature between about 45°C and less than about 200°C to a moisture content of less than about 14 percent by weight of the mixture so as to produce a finely divided flour.

3,963,836

PREPARATION OF YOGURT AND QUARK

Alec Frank Henson, Twickenham, England, and Gerard Marcel Marius Bret, The Hague, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 358,441, May 8, 1973, abandoned. This application Jan. 3, 1975, Ser. No. 538,426

Claims priority, application United Kingdom, May 10, 1972, 21793/72

Int. Cl.² A23C *19/02*, *23/00*

U.S. Cl. 426—40 2 Claims

1. Process for the preparation of whipped quark having at least 200% unaided overrun comprising the steps of

a. pasteurizing milk at a temperature of from about 55 to 80°C for about one half of 1 minute to about 30 minutes,

b. cooling the pasteurized milk to a temperature of about 5°C to 50°C,

c. filtering the cooled pasteurized milk through a semi-permeable membrane which is permeable with respect to mineral salts and has a rejection characteristic of at least 0.8 with respect to milk proteins at a pressure of from 1 to 50 kg/cm² to obtain a protein-rich residue separated from a mineral salt-rich filtrate,

d. discontinuing the filtration when the volume of the residue is from 25 to 80 volume percent of the original volume of the milk, said residue containing from about 4% to about 15% protein,

e. adjusting the temperature of the residue to 20° to 35°C,

f. inoculating the residue with 0.1 to 5 weight percent of a quark culture lactic acid starter,

g. incubating the inoculated residue for a period from 12 to 24 hours to a pH of about 4.5 to coagulate milk proteins,

h. discontinuing further inoculation when coagulation is substantially complete and removing any whey separated, and

i. whipping the coagulum obtained to an overrun of at least 200%.

3,963,837

PREPARATION OF CHEESE FROM ULTRAFILTERED MILK

Jean-Louis Joseph Maubois, 35 Rennes; Germain Pierre Charles Gabriel Mocquot, 78 Versailles, and Louis Jean Vassal, 78 Jouy-en-Josas, all of France

Continuation-in-part of Ser. No. 53,002, July 7, 1970, abandoned, and a continuation-in-part of Ser. No. 299,837, Oct. 24, 1972, and a continuation-in-part of Ser. No. 321,125, Jan. 5, 1973, Pat. No. 3,914,435, said Ser. No. 299,837, is a continuation-in-part of Ser. No. 53,002, , said Ser. No. 321,125, is a continuation-in-part of Ser. Nos. 53,002, and Ser. No. 299,837,. This application Feb. 27, 1974, Ser. No. 446,392

Claims priority, application France, Feb. 28, 1973, 73.07117

Int. Cl.² A23C *19/02*

U.S. Cl. 426—40 6 Claims

1. A method for making a cheese from milk, which comprises:

separating said milk into a first liquid filtrate component and a second retained liquid retentate component by contacting said milk with a semi-permeable membrane, the average pore diameter of which is from 3 to 30 mμ, at a pressure of from 1 to 50 kg/cm², said first liquid filtrate component passing through said semi-permeable membrane and said second liquid retentate not passing through said semi-permeable membrane, said second liquid retentate having a higher concentration of proteins than said first liquid component, said semi-permeable membrane and said pressure as set forth above being selected so that the lactose and mineral salts in the aqueous phase of the milk pass through the semi-permeable membrane in substantially the proportions they appear in said aqueous phase of said milk;

maintaining and continuing contact of said second liquid retentate at said pressure and under agitated conditions adjacent said membrane until a filtrate has been separated in substantial amount, and a liquid milk retentate is obtained having protein, lactose, and mineral salt contents substantially equal to that known to exist in a desired organoleptically acceptable cheese;

partially drying said second liquid retentate and adding lactic starter thereto at a temperature less than 13°C;

drying said partially dried retentate containing said starter; and

rehydrating said dried retentate and transforming said rehydrated product into cheese by the addition of rennet thereto.

3,963,838

METHOD OF OPERATING A QUARTZ FLUIDIZED BED REACTOR FOR THE PRODUCTION OF SILICON

H. S. N. Setty; Carl L. Yaws, both of Dallas; Bobby Ray Martin, Plano, and Daniel Joseph Wangler, Irving, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 24, 1974, Ser. No. 473,033

Int. Cl.² B05D *7/00*

U.S. Cl. 427—213 3 Claims

1. A method of operating a quartz wall fluidized bed deposition reactor for depositing silicon on a bed of silicon seed particles comprising the steps of:

forming a bed of silicon seed particles in said reactor;

charging said reactor with an inert gas stream;

heating said reactor to a deposition temperature between 950°–1250° C;

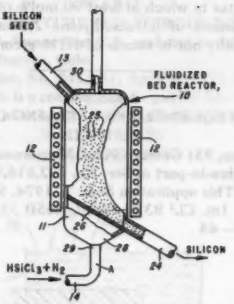
gradually removing said inert gas stream and charging said reactor with a gaseous reactant stream comprised of silicon chloride and/or a chlorosilane, said reactant stream maintaining said particles in fluidized suspension;

maintaining said deposition temperature for a predetermined length of time, whereby deposition of said silicon

material on said quartz wall does not exceed a thickness of 2 mils;

gradually removing said reactant stream and charging said reactor with said inert gas;

cooling said reactor to a temperature between 30–600° C whereby silicon material deposited on said quartz reactor wall shatters and peels from said wall;



reheating said reactor to said deposition temperature;

again gradually removing said inert gas stream and charging said reactor with said gaseous reactant stream; and charging said reactor with said gaseous reactant stream;

maintaining said deposition temperature; and

continuously adding new silicon particles to said bed while removing from said reactor larger silicon particles upon which sufficient silicon material is deposited without reactor breakage.

3,963,839

METHOD FOR THE PREPARATION OF THIN LAYERS OF TUNGSTEN AND MOLYBDENUM

Helmut Freiler, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1974, Ser. No. 501,660

Claims priority, application Germany, Sept. 14, 1973, 2346394

Int. Cl.² C23C *11/02*

U.S. Cl. 427—251 **5 Claims**

1. Method for the preparation of thin layers of a heavy metals selected from the group consisting of tungsten and molybdenum on a highly temperature-resistant substrate comprising:

a. heating a heavy metal oxide selected from the group consisting of tungsten VI oxide and molybdenum VI oxide under high vacuum to form an evaporated metal oxide;

b. contacting said evaporated metal oxide with a temperature-resistant substrate heated at a temperature sufficient to decompose said evaporated metal oxide whereby said metal oxide is decomposed at the vicinity of or at the surface of said substrate into a solid heavy metal phase and a gaseous oxygen phase, said heavy metal phase being deposited as a thin layer on said substrate; and

c. removing said gaseous oxygen phase from said evaporated metal oxide as it is formed.

3,963,840

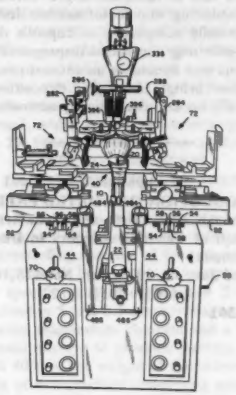
CEMENT LASTING THE SIDE AND HEEL PORTIONS OF A SHOE ASSEMBLY

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed May 6, 1974, Ser. No. 467,522

Int. Cl.² B05C *11/10, 5/02*

U.S. Cl. 427—284 **3 Claims**



2. A method of applying cement in the corner between a portion of an upper margin and the corresponding portion of an insole periphery comprising: supporting a shoe assembly comprised of a last having the upper mounted thereon and the insole located on its bottom; initially retaining a cement applying member in an inner position spaced inwardly from said corner; thereafter yieldably urging the cement applying member outwardly under relatively high pressure to move the cement applying member into said corner; thereafter yieldably urging the cement applying member outwardly under relatively low pressure to retain the cement applying member in said corner; and thereafter moving the cement applying member lengthwise of the shoe assembly while it is retained in said corner by being yieldably urged outwardly under relatively low pressure.

3,963,841

CATALYTIC SURFACE PREPARATION FOR ELECTROLESS PLATING

Morris Anschel, Carmel, and Stephen Anthony Shear, Greenfield Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1975, Ser. No. 539,206

Int. Cl.² C23C *3/02*

U.S. Cl. 427—304 **13 Claims**

1. A catalyst solution for making surfaces receptive to electroless deposition of adherent metal layers consisting essentially of:

a complex of a salt of a precious metal of period 5 and 6 of group VIII of the periodic table with dimethyl sulfoxide; at least a stoichiometric amount based on the group VIII salt of a group IV metal salt capable of reducing the precious metal ion to an elemental form, the group IV metal being selected from the group consisting of tin, titanium and germanium; and an organic solvent.

3,963,842

DEPOSITION OF COPPER

Christian Sivertz, London, Canada, and Anthony J. Basilone, Guilford, Conn., assignors to London Laboratories Limited Co., Woodbridge, Conn.

Continuation-in-part of Ser. No. 481,332, June 20, 1974, abandoned. This application Nov. 6, 1974, Ser. No. 521,338

Int. Cl.² B05D 3/04, 3/10

U.S. Cl. 427—305 13 Claims

1. In a process for the deposition of metallic copper on a catalytically activated surface by disproportionation of cuprous ions in an aqueous solution to effect deposition of metallic copper on said surface, the improvement which comprises rapidly reducing cupric tetraamino ions in aqueous solution substantially completely to cuprous diammino ions and thereafter effecting controlled disproportionation of the resultant cuprous ions by adding an activator-modifier, which activator-modifier brings about the deposition of metallic copper principally on said catalytically activated surface.

3,963,843

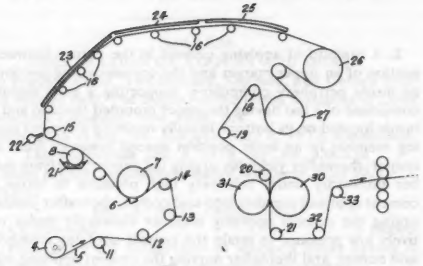
PRODUCTION OF COATED PAPER

John R. Hitchmough, Baie d'Urfe, and Clyde Arthur Wetmore, Cornwall, both of Canada, assignors to Domtar Limited, Montreal, Canada

Filed Jan. 10, 1974, Ser. No. 425,101

Int. Cl.² B05D 3/12

U.S. Cl. 427—361 9 Claims



1. A method of producing a coated paper having a finished surface of high smoothness and improved printability and glueability comprising coating a fibrous cellulosic web with an aqueous coating composition consisting essentially of a major proportion of an inorganic filler, a minor proportion of a thermoplastic alkali-swelled water retentive synthetic resin binder and a small amount of a release agent, gradually drying said coated web substantially uniformly to a moisture content of not more than 6% and to obtain a relatively uniform distribution of binder through the coating layer, thereafter directly passing said dried coated web through a pressure nip with said coating layer in contact with a finishing roll having a surface heated to a temperature of between 200° to 300°F, and discontinuing contact of said web with said finishing roll immediately past said nip, said small amounts of release agent being sufficient to prevent sticking of the coated surface to the heated roll surface.

3,963,844

EXTRUSION-MOLDED ARTICLE HAVING GOOD THERMAL STABILITY

Sakae Shimotsuma, Atsugi; Masahiro Hosoi, Sagamihara; Takatoshi Kuratsuji, Iwakuni; Shoji Kawase, Iwakuni, and Takeo Shima, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed June 10, 1974, Ser. No. 478,101

Claims priority, application Japan, June 13, 1973, 48-65779; Aug. 29, 1973, 48-96229

Int. Cl.² F16L 9/12

U.S. Cl. 428—36 9 Claims

1. A thermally stable unstretched extrusion-molded article comprising an extrusion-molded, unstretched substantially linear polyester in which at least 90 mol% of the total recurring units consist of tetramethylene 2,6-naphthalate units, having a density not in excess of 1.318 g/cm³.

3,963,845

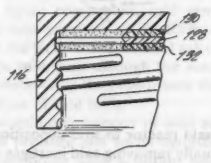
HIGH FREQUENCY HEAT SEALING CONTAINER CLOSURE

Joseph Dukess, 931 Greacen Point, Mamaroneck, N.Y. 10543

Continuation-in-part of Ser. No. 222,614, Feb. 1, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,424

Int. Cl.² B32B 31/20; B65D 53/04

U.S. Cl. 428—64 1 Claim



1. Liner material adapted to be removably mounted in a cap comprising a disc including a pair of outer layers and an intermediate layer sandwiched between said outer layers and bonded thereto, said outer layers being of a relatively nonresilient thermoplastic resinous material and containing metal powder selected from the group consisting of iron, copper and steel therein, said outer layers, due to the presence of said metal powder, being capable of being bonded to the mouth of a plastic or glass container when exposed to high frequency radiation to provide an effective bond seal and closure for the contents of the container, said intermediate layer being of a resilient, compressible foam thermoplastic rubber-like material capable when compressed of exuding a tongue beyond the peripheral edges of said outer layers to frictionally seal said liner with said cap, said liner, when uncompressed, being freely rotatable within said cap after breaking said bonded seal.

3,963,846

MARBLE-FACED COMPOSITE SURFACE ELEMENT

Patrick Terence Bourke, Earl of Mayo, Doon House, County Galway, Maam, Ireland

Filed Sept. 4, 1973, Ser. No. 394,138

Claims priority, application United Kingdom, Sept. 4, 1972, 40839/72; Jan. 19, 1973, 2795/73

The portion of the term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

Int. Cl.² B32B 3/12; E04C 1/00, 2/00

U.S. Cl. 428—73 3 Claims

1. A composite surface element comprising a lamina of natural facing stone 2 to 5 millimeters in thickness bonded by adhesive to a backing sheet consisting of a multicellular resin-impregnated paper core of substantially greater thickness than

said lamina and having a skin of sheet material of greater tensile strength than said core bonded to the side of said core

opposite said lamina, the cell walls of said multicellular paper core being perpendicular to the plane of the sheet.

3,963,847

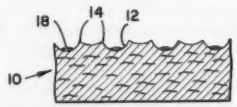
SURFACE TEXTURE FOR FIBROUS BOARDS

Fred C. Norgard, Somerville, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 241,161, April 5, 1972, Pat. No. 3,870,540, which is a continuation-in-part of Ser. No. 49,325, June 24, 1970, abandoned. This application Dec. 23, 1974, Ser. No. 539,195

Int. Cl.² B32B *19/00*

U.S. Cl. 428—147 8 Claims



1. A fibrous board having a decorative, randomly textured surface on one face comprising:

a water laid compressed mat of entangled fibers having one surface containing surface graders produced by a method comprising:

a. forming a water laid lap of entangled fibers;

b. substantially uniformly distributing a layer of discreet particles of a foamed synthetic organic thermoplastic resinous material on one surface of the water laid lap of entangled fibers such that most of the particles abut one another before pressing the wet lap;

c. pressing the particles into the wet lap to embed the particles in the wet lap; and

d. heating the wet lap to reduce the volume of the foam material and leave said craters in the surface which produce a unique random surface texture;

with substantially all of said craters containing a small volume of said synthetic organic thermoplastic resinous material, and, said board containing in those areas where said particles did not abut, fibrous areas positioned between adjacent craters, the fibrous areas possessing a substantially rougher exterior surface than the walls of the craters.

3,963,848

FLEXIBLE COATED SHEET MATERIAL

John Bentley, Maidenhead; Brian Robert Letchford, Flackwell Heath, and Thomas Whitehead Stafford, Hyde, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 15, 1974, Ser. No. 451,691

Claims priority, application United Kingdom, Mar. 26, 1973, 14348/73

Int. Cl.² B32B *3/00*

U.S. Cl. 428—172 5 Claims

1. A decorative sheet material comprising a flexible sheet material provided on its decorative surface with a flexible coating such that the decorative sheet material is sufficiently flexible to allow it to be rolled up for storage without damage to said coating, said flexible coating having a thickness in excess of 0.0025 centimeters and being an organic material which is curable on exposure to actinic light, said organic material being a blend of a thermoplastic polymer and one or more ethylenically unsaturated monomers which are capable of being polymerised by free radical addition polymerisation in the presence of a photosensitive catalyst on exposure of the blend to actinic light, the coated sheet being rolled up in the absence of actinic light whereby when the coated sheet is unrolled and attached to a wall or other surface so exposing the coating to actinic light a less flexible coating on said flexible sheet results.

3,963,849

FIREPROOF PRODUCT USING MAGNESIUM OXYCHLORIDE CEMENT

Henry Clark Thompson, Saratoga, Calif., assignor to Thompson Chemicals, Inc., Palo Alto, Calif.

Division of Ser. No. 194,557, Nov. 1, 1971, Pat. No. 3,778,304, which is a continuation-in-part of Ser. No. 811,616, March 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 589,808, Oct. 27, 1966, abandoned. This application Sept. 17, 1973, Ser. No. 397,835

Int. Cl.² B32B *3/28, 5/18, 17/00*

U.S. Cl. 428—182 7 Claims

1. An article of manufacture comprising a burnable porous substrate impregnated substantially throughout its cross section with a fireproofing amount of foamed magnesium oxychloride cement formed by mixing aqueous magnesium chloride having a specific gravity of between 21.5° and 22.5° Baume with between 5 and 6.5 pounds magnesium oxide per gallon of aqueous magnesium chloride and a frothing agent reactive with said mixture to produce bubbles, in an amount between 2 and 40% of the weight of the substrate.

6. An article of manufacture comprising glass fibers and a fireproofing amount of foamed magnesium oxychloride cement made by mixing aqueous magnesium chloride having a specific gravity between 21.5° and 22.5° Baume with between 5 and 6.5 pounds magnesium oxide per gallon of aqueous magnesium chloride and a metallic frothing agent reactive with said mixture to produce bubbles, said cement being present in an amount between 2 and 40% of the weight of the glass fibers.

3,963,850

ADHESIVE FORMULATION IMPROVED WITH SOLID FILLERS

Richard C. Doss, Bartlesville, and Faber B. Jones, Nowata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 29, 1970, Ser. No. 76,608

Int. Cl.² C08K *7/12*

U.S. Cl. 428—286 2 Claims

1. A laminate consisting of at least one substrate of porous web-like material bonded to at least one other web-like substrate by an adhesive composition consisting essentially of a carboxylated styrene-butadiene and at least one of casein and soy bean protein adhesives said composition having incorporated therein up to about 5 percent by weight of a high surface area asbestos filler material.

3,963,851

PAPER FOR ADHESIVE STICKERS AND THE LIKE

Takashi Toyoda, Ibaraki, Japan, assignor to Kabushiki Kaisha Oji Yuka Goseishi Kenkyujo, Tokyo, Japan

Continuation of Ser. No. 273,964, July 21, 1972, abandoned. This application Oct. 9, 1974, Ser. No. 513,473

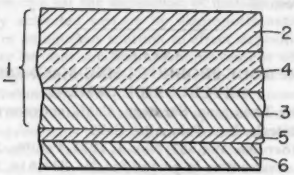
Claims priority, application Japan, Aug. 6, 1971, 46-59485

Int. Cl.² B32B *3/26, 5/18*

U.S. Cl. 428—305 5 Claims

1. A stock paper for adhesive use comprising, in combination as a laminated structure, a papery layer of a synthetic-resin film having a filler content of 8 – 20% by volume of the papery layer and having a void content of from 20 to 60

percent, a substrate layer of a synthetic-resin film having a filler content of 0.5 – 8% by volume of the substrate layer and having a void content of from 2 to 30 percent and having a surface to adhere to a backing paper and at least one intermediate layer of a synthetic-resin film interposed between the



paper layer and the substrate layer, each of said papery substrate layers being monoaxially stretched to an elongation of at least 3.5 times and said intermediate layer being biaxially stretched, said filler content and void content of the papery layer being higher than the filler content and void content of the substrate layer.

3,963,852

CLAY-COATED RECORD MATERIAL OF IMPROVED IMAGE DURABILITY

George Baxter, Font Hill, Canada, assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation of Ser. No. 357,261, Aug. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 125,075, March 17, 1971, abandoned. This application Mar. 6, 1975, Ser. No. 555,742

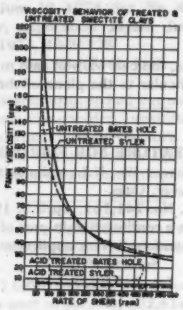
Int. Cl.[2] B41M *5/00, 5/12*

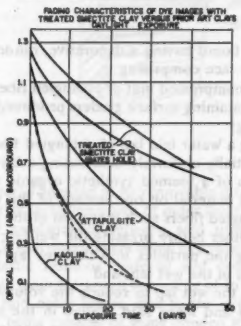
U.S. Cl. 428—325 **26 Claims**

1. Record material for forming a colored image of improved resistance to fading on imagewise contact with an image-forming material consisting essentially of an electron-donating colorless dye precursor compound, comprising a support carrying a uniform even distribution throughout a recording area thereof of a multitude of finely divided particles of a clay consisting essentially of at least about 15% by weight of montmorillonite clay mineral having an expanding three-layer lattice molecular structure exhibiting when analyzed in the presence of benzyl ether of Michler's hydrol by X-ray diffraction at least a discernible peak at a 2 θ value of 5.6–5.7, a sufficient proportion of said molecular structure having been irreversibly chemically altered to impart substantially Newtonian viscosity behavior to an aqueous suspension containing at least about 15% by weight of said clay particles.

18. The method of making a record material useful for producing images having improved resistance to fading on contact with an organic electron-donating dye precursor compound reactive to produce color with an electron-acceptor solid comprising the steps of:

1. Contacting a clay consisting essentially of at least about 15% by weight of montmorillonite clay mineral having an expanding three-layer lattice molecular structure with an aqueous solution of an acid effective to alter the molecular structure of said clay for a time of at least about one hour but less than the time required to so alter the molecular structure of said clay that on examination by X-ray diffraction in the presence of benzyl ether of Michler's hydrol no discernible peak appears at a 2 θ value of about 5.6–5.7,
2. Dispersing said acid-treating clay in an aqueous medium to give a concentration therein of said acid-treated clay at least about 10% by weight,
3. Applying said clay dispersion to a supporting web or sheet to give a uniform even distribution of clay particles


VISCOSITY BEHAVIOR OF TREATED & UNTREATED BENTONITE CLAYS
UNTREATED BATES HOLE
UNTREATED SYLER
ACID TREATED BATES HOLE
ACID TREATED SYLER
RATE OF SHEAR (rps)


FADING CHARACTERISTICS OF DYE IMAGES WITH TREATED BENTONITE CLAY VERSUS UNION ART CLAYS
DAYLIGHT EXPOSURE
TREATED BENTONITE CLAY (BATES HOLE)
ATTAPULGITE CLAY
KAOLIN CLAY
OPTICAL DENSITY (ABOVE BACKGROUND)
EXPOSURE TIME (DAYS)

at one surface of said web or sheet, and

4. Drying the resultant web or sheet.

3,963,853

PRESSURE SENSITIVE TRANSFER SHEET

Nigel Hughes, and Andrew Hunter Morris Renfrew, both of Manchester, England, assignors to Wiggins Teape Limited, London, England

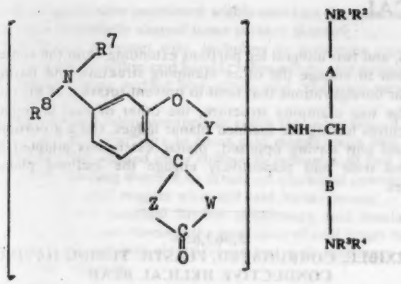
Filed Dec. 27, 1972, Ser. No. 318,774

Claims priority, application United Kingdom, Dec. 30, 1971, 60730/71

Int. Cl.[2] B41C *1/06;* **B41M** *5/16*

U.S. Cl. 428—326 **26 Claims**

1. A transfer sheet, for use in a pressure-sensitive copying system, comprising a support material having on one surface thereof a coating composition containing at least one colourless colour former, wherein said colourless colour former comprises a single organic compound having the structural formula:



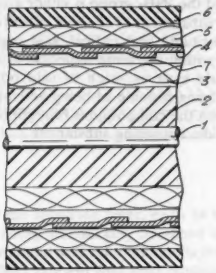
wherein Y represents a phenylene or naphthylene or substituted phenylene or naphthylene radical, Z represents a 1,2-phenylene or substituted 1,2-phenylene radical, W represents oxygen or a group of the formula -NR^6- wherein R^6 is selected from the group consisting of hydrogen, lower alkyl, aryl, substituted lower alkyl, and substituted aryl radicals, A and B each independently represents a 1,4-phenylene residue, R^1, R^2, R^3 and R^4, each is selected from the group consisting of lower alkyl, substituted lower alkyl, aralkyl, substituted aralkyl, cycloalkyl and substituted cycloalkyl radical or forms part of a divalent organic chain which together with the attached nitrogen atom constitutes a heterocyclic ring, R^7 and R^8 each independently represents a lower alkyl or substituted lower alkyl radical, and the -NH- group is either attached to Y or is attached as one substituent or the sole substituent of R^6 when said R^6 is a substituted aryl radical, said organic compound thus containing within the same molecule at least two potential chromophoric systems, each of said potential chromophoric systems being capable of being activated substantially immediately when the compound is brought into contact with one or more acidic activating substances.

3,963,854

SHIELDED CABLES

Eliot Patrick Fowler, Studland, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 5, 1974, Ser. No. 529,721
Int. Cl.² H01B 9/02
U.S. Cl. 174—36 10 Claims



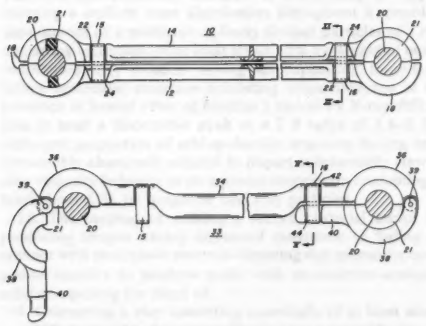
1. A shielded electrically conducting cable comprising at least one inner electrical conductor electrically insulated from a surrounding wire braid, and a lengthwise flexible metal tube surrounding the wire braid with an annular clearance between the tube and the braid.

3,963,855

BOLTLESS SPACER CLAMP

Ronald G. Hawkins, and Charles R. Russ, both of Massena, N.Y., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 5, 1975, Ser. No. 610,527
Int. Cl.² H02G 7/12
U.S. Cl. 174—40 R 11 Claims



1. A boltless device for spacing at least two parallel, spaced-apart conductors, the device comprising rigid clamping structures adapted to be secured to the two conductors, with at least one of the structures having two outwardly facing planar ledges inclined toward the other clamping structure when the structures are placed together in face-to-face relation, two resilient clips adapted to secure said clamping structures together on said conductors at the location of the inclined planar ledges, each of said clips being made from flat metal, resilient stock and having a configuration which provides a center portion disposed to engage one of the clamping structures, and two integral leg portions extending from the center portion to engage the other clamping structure and having planar configurations that tend to prevent rotation of the clip on the one clamping structure, the other of said clamping structures having the inclined planar ledges, the leg portions of said clip having opposed, planar extensions adapted to extend over and respectively engage the inclined planar ledges.

3,963,856

FLEXIBLE, CORRUGATED, PLASTIC TUBING HAVING CONDUCTIVE HELICAL BEAD

Lennart L. Carlson, Tustin, and Douglas I. Holberg, Fullerton, both of Calif., assignors to Steward Plastics, Inc., Orange, Calif.

Filed Nov. 25, 1974, Ser. No. 526,671
Int. Cl.² F16L 11/12
U.S. Cl. 174—47 12 Claims

1. In a flexible, corrugated, electrically conductive, plastic tubing, the combination of:

a. a flexible, thin-walled synthetic organic plastic tube;

b. an electrically conductive, helical bead on and secured to the outer surface of said tube;

c. said bead being a flexible synthetic organic plastic having mixed therewith an electrically conductive particulate material;

d. said bead, and the outer surface of said tube intermediate the convolutions of said bead, constituting the outer surface of said tubing; and

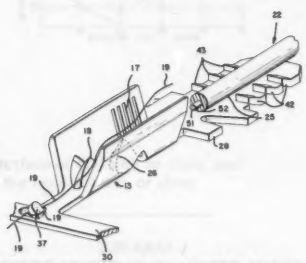
e. the inner surface of said tube constituting the inner surface of said tubing.

3,963,857

SMALL MAGNET WIRE TO LEAD WIRE TERMINATION

Charles Edward Reynolds, Mechanicsburg, and Charles Harry Weidler, Lancaster, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 12, 1974, Ser. No. 505,422
Int. Cl.² H01P 5/08
U.S. Cl. 174—84 C 3 Claims



1. In combination, a terminal connecting together a magnet wire having a first insulation coating thereon to a larger diameter wire having an inner conductor and a second insulation thereon and comprising:

barrel means having an irregularly shaped inner surface formed integrally therewith;

said barrel means comprising insulation piercing tangs formed integrally with said barrel means and extending inwardly into said barrel means;

said insulation piercing tangs offset with respect to said irregularly shaped surface along the axis of said barrel means;

said magnet wire positioned within said barrel means across said irregularly shaped inner surface thereof;

said larger diameter wire, including its insulation coating, positioned within said barrel means across said irregularly shaped inner surface and across said insulation piercing means;

said terminal being crimped to cause the insulation of said larger diameter wire to force said magnet wire into said irregularly shaped inner surface to rupture said first insulation coating thereon to create an electrical connection between said magnet wire and said barrel means;

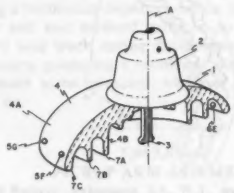
said crimped terminal further positioning said insulation piercing means through the insulation of said larger diameter wire and into electrical contact with said inner conductor thereof.

3,963,858

HIGH-VOLTAGE ELECTRICAL INSULATOR ADAPTED TO PREVENT FLASHOVER

Tsen-Chung Cheng, Los Angeles, Calif.; Gerald L. Wilson, Wayland, and David C. Jolly, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 21, 1975, Ser. No. 570,147
Int. Cl.² H01B *17/42*
U.S. Cl. 174—141 R **16 Claims**



1. An insulator that comprises, in combination: electrically insulating shell means having a convex upper surface and a concave lower or under surface formed in such a way that an arc in the course of flashover with respect to the shell means must occur by moving generally radially across one surface and to the other surface; and a plurality of discrete, circumferentially-spaced conductive regions disposed at one said surface and arranged in a configuration and sufficient in number to intercept an arc in the event of incipient flashover from proceeding radially past the discrete conductive regions at the one said surface of the shell, thereby to prevent said flashover, the entire exposed portion of each discrete conductive region having a smooth surface to reduce electric field intensification and to reduce the prospect of initiating an arc.

3,963,859

SUPPORT ASSEMBLY FOR ELECTRIC HEATING UNIT

Robert E. Petersen, Grafton, and Roger F. Chesebro, Bay Village, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

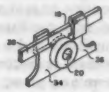
Filed Oct. 28, 1975, Ser. No. 626,412
Int. Cl.² H05B *3/02*
U.S. Cl. 174—148 **5 Claims**

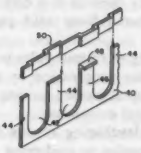
1. A support member carrying insulating bushings for supporting an open coil electrical heating element, comprising:

a strip having a number of spaced-apart, open-sided cutouts with intervening webs;

an insulating bushing in each said cutout, said bushings each having a circumferential groove seating in the cutout to hold said bushing against transverse disengagement from the strip;

a locking bar closing the open sides of said cutouts to hold said bushings against upward disengagement from said cutouts, said locking bar lying on alternating sides of successive webs along the length of the strip; and





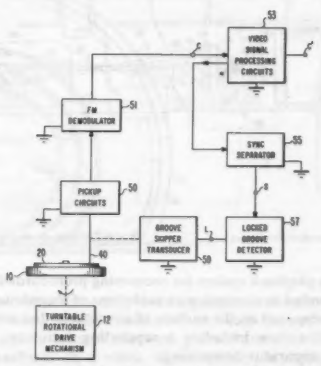
at least two of said webs including end margin portions displaced to overlie the top edge of said bar at those web locations to hold said bar against disengagement upwardly away from the cutouts.

3,963,860

LOCKED GROOVE DETECTION AND CORRECTION IN VIDEO DISC PLAYBACK APPARATUS

Thomas William Burrus, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,817
Int. Cl.² G11B *3/28;* **H04N** *5/76*
U.S. Cl. 178—6.6 R **11 Claims**



1. In video disc playback apparatus for use with a video disc having a spiral information track containing representations of recorded composite video signal information inclusive of regularly recurring sync signals with sync signal recording locations non-radially aligned in successive convolutions of the spiral track; said playback apparatus including a signal pickup for sensing said information representations along said spiral information track as said disc is rotated, and means coupled to said signal pickup for providing a composite video signal output corresponding to the recorded information sensed by said signal pickup, wherein normal operation involves the sensing of said information representations along successive convolutions of said spiral track in a regular progression toward one spiral extremity; the combination comprising:

means, responsive to the composite video signal output of said output providing means, for separating said sync

signals from other components of said composite video signal;

a voltage controlled oscillator;

a phase detector, responsive to said separated sync signals and to an output of said oscillator, for developing an output having an amplitude and a polarity indicative of the magnitude and sense, respectively, of departures, if any, from a predetermined phase relationship between said separated sync signals and said oscillator output;

a low pass filter responsive to said phase detector output for developing an error voltage;

means for applying said error voltage to said oscillator to vary the frequency thereof in a direction tending to oppose said departures from said predetermined phase relationship; and

means for developing an output pulse indicative of a disruption of said regular progression by a shift of the radial location of said signal pickup sensing in a direction away from said one spiral extremity;

said output pulse developing means including a voltage comparator responsive to said error voltage and providing said output pulse only when said error voltage is indicative of a given sense of departure from said predetermined phase relationship and reaches an amplitude exceeding a selected threshold level.

3,963,861

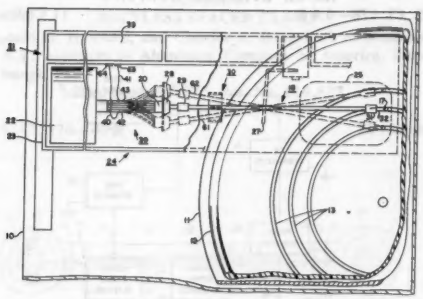
DISC RECORD GROOVE SKIPPER APPARATUS

Horatio Nelson Crooks, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,818

Int. Cl.² H04N 5/76

U.S. Cl. 178—6.6 R **8 Claims**



1. In a playback system for recovering prerecorded information encoded in successive convolutions of a continuous spiral groove disposed on the surface of a rotatable disc record, said playback system including a supporting structure; a groove skipper apparatus comprising:

1. a replaceable pickup arm unit which comprises:

A. a signal pickup having a stylus adapted for entry in the spiral groove of the rotating disc record during playback, and normally subject upon the entry to retention within the groove by the walls of the groove during the disc record rotation so that the information encoded in successive convolutions of the spiral groove is recovered in sequence by the stylus; and

B. a pickup arm having the signal pickup fixedly secured at one end thereof;

2. means for selectively changing the groove convolution in which the pickup stylus is retained comprising:

A. a support member for releasably securing an end of the pickup arm remote from the signal pickup, wherein the support member permits arcuate motion of the pickup arm in order to accommodate vertical and lateral motion of the signal pickup stylus in the disc record spiral groove during playback;

B. a bimorph element having a first end and a second end which are fixedly secured respectively to (*a*) the support member, and (*b*) the supporting structure, wherein the bimorph element is not subject to the arcuate motion of the pickup arm, and wherein the bimorph element, in response to a control signal application thereto, deflects the support member in order to change the groove convolution in which the pickup stylus is retained;

C. means for generating the control signal; and

D. means mounted on the supporting structure for electrically coupling the control signal generating means to the bimorph elements.

3,963,862

RECORD CARRIER FOR A TELEVISION SIGNAL

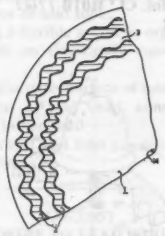
Gijsbertus Bouwhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,164

Claims priority, application Netherlands, Sept. 25, 1974, 7412634

Int. Cl.² H04N 5/76

U.S. Cl. 178—6.6 R **5 Claims**



1. A record carrier of the type on which a television signal is stored in tracks in the form of a radiation modulating information structure of constant track width recorded along an average track path, which structure modulates the phase of a read beam of radiation, the stored television signal comprising a first carrier wave which is frequency modulated with the luminance information, and further carrier waves which are modulated with additional information, the improvement wherein the tracks of the information structure are continuous tracks which in the plane of said structure exhibit undulation transverse to the average track path, the amplitude, frequency and phase characteristics of said undulation being determined by both the first and the additional modulated carrier waves, the undulation amplitude being substantially smaller than the period of the track structure in a direction transverse to the average track path, the tracks comprising a means for providing a difference in optical pathlength in the read beam which is approximately equal to an odd multiple of a quarter of the wavelength of the read beam of radiation.

3,963,863

DEVICE FOR READING OUT INFORMATION RECORDED UPON A SUBSTRATE

Roland Malissin, and Lucien Lainez, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 14, 1974, Ser. No. 451,371

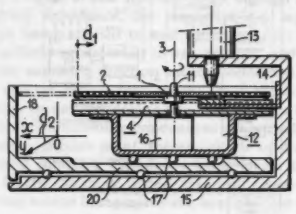
Claims priority, application France, Mar. 19, 1973, 73.09717

Int. Cl.² G11B 17/00

U.S. Cl. 178—6.6 R **14 Claims**

1. A device for the optical read-out of a recording substrate, constituted by a flexible disc comprising at least one track carrying information, said device comprising: a base; a pickup comprising a radiant energy source and a head, receiving

said radiant energy and projecting a reading spot on said track, said pick-up being fixed on said base and having no contact with said substrate; a plate designed to receive said substrate and comprising a driving gear of said substrate, and means for displacing said substrate, designed for maintaining said spot on said tract during the reading out, said driving gear being movable in relation to said base, under the action of said displacing means, and having a travel long enough to make it possible to retract said substrate beyond said pick-up; said



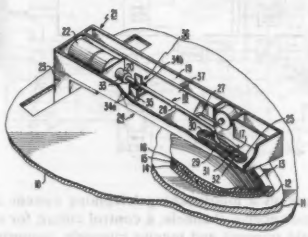
driving gear comprising a shaft with a shoulder against which said flexible disc seats, and a set of two flat supporting surfaces inclined in relation to a plane perpendicular to axis of rotation of said shaft; said displacing means comprising first means for producing a rectilinear displacement on the plate, comprising said gear and said inclined surfaces, so that said spot can remain on said track during the rotation of said disc, and second means producing a rectilinear displacement enabling said substrate to be retracted, whatever the position of said substrate be.

3,963,864

PICKUP ARM ASSEMBLY

Jack Selig Fuhrer, Princeton Jct., N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 522,813, Nov. 12, 1974, abandoned.
This application Aug. 12, 1975, Ser. No. 603,805
Int. Cl.[2] G11B *3/02*
U.S. Cl. 178—6.6 R **3 Claims**



1. In a playback system for recovering prerecorded signals from a disc record, said system including a signal pickup having a tip adapted for entry in a spiral groove of a disc record mounted on a surface of a rotatable turntable, said signal recovery being effected by said signal pickup when relative motion between said pickup and the record groove is established, said playback system also including a supporting structure and signal processing circuitry; a pickup arm assembly comprising:

a pickup arm having first and second ends; said pickup arm including a first straight portion terminating at said first end and disposed in a direction substantially parallel to said turntable surface when said pickup tip is positioned for disc groove entry;

means, secured to said supporting structure, for providing pivotal support for said pickup arm at said first end;

a signal pickup holder, said signal pickup being supported at one end of said holder;

means, secured to said second end of said pickup arm, for providing pivotal support for said signal pickup holder at an end of said holder remote from said one end; said signal pickup holder extending between said remote end and said one end in a direction substantially parallel to said straight portion of said pickup arm;

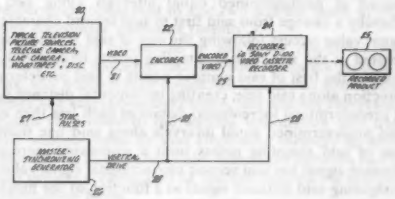
said pickup arm also including a further portion angled toward said turntable surface when said pickup tip is positioned for disc groove entry, and serving to locate said second end of said pickup arm, during record playback, in a position establishing an angle between (a) the record surface, and (b) a line joining the signal pickup tip and the effective pivot point provided for said signal pickup holder by said second-named pivotal support providing means, which angle is significantly smaller than the angle that would be established, during record playback, between (A) the record surface, and (B) a line joining the signal pickup tip and the effective pivot point provided for said signal pickup holder by said second-named pivotal support providing means if said pickup arm and said holder extended in a straight line between said pickup arm first end and said holder one end.

3,963,865

ANTI-PIRACY METHOD AND SYSTEM

Jimmie D. Songer, Hollywood, Calif., assignor to Trans-American Video, Inc., Hollywood, Calif.

Filed June 4, 1975, Ser. No. 583,649
Int. Cl.[2] H04N *3/16*, *1/44*; H04M *1/70*; H04N *5/78*
U.S. Cl. 178—7.1 **23 Claims**



1. A method of encoding video signals in a manner to allow display of video picture information on a television receiver or monitor and to hamper playback thereof from a video tape made therefrom on a video tape recorder, comprising the steps of

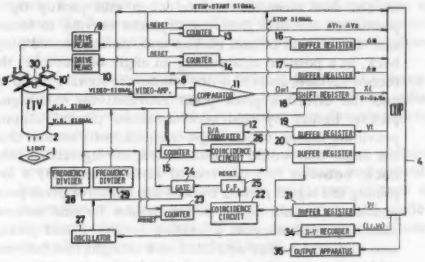
generating a composite video signal train from a video information source, said composite video signal train comprising video picture information and a vertical interval, the vertical interval including in time a first equalizing pulse interval, a vertical sync pulse interval, a second equalizing pulse interval, and horizontal pulses, and

encoding the vertical interval of said composite video signal train by changing at least a portion of said vertical sync pulse interval after approximately the first one and one half pulses of said vertical sync pulse interval, said change being insufficient to prevent display upon receipt of the resulting encoded composite video signal train by a television receiver or monitor, but being sufficient to prevent normal operation of vertical circuit means of a video tape recorder to thereby hamper proper recording by said recorder on tape of necessary synchronizing information for proper playback of the tape.

3,963,866
SYSTEM FOR DETERMINING THE CONTOUR OF A PLANE FORM

Kazuo Tanie, Yokohama, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,326
Claims priority, application Japan, Sept. 11, 1972, 47-91574
Int. Cl.² H04N 5/38
U.S. Cl. 178—7.2 **15 Claims**



1. Method for generating distance signals signifying the distance along a line from a determined starting location of contour points on the contour of a plane form on a background surface, said surface having a first scannable characteristic value at points inside said contour and a second scannable characteristic value at points outside of said contour, comprising in combination, the steps of scanning said line in a predetermined direction and creating a plurality of sampling signals each having a first or second characteristic signal value in correspondence to the value of said scannable characteristic at a corresponding one of a plurality of sampling points spaced at predetermined equal intervals along said line, whereby a change from said first to said second characteristic signal value occurs following the one of said scanning signals created at the one of said sampling points immediately preceeding the first of said contour points in said predetermined direction along said line; creating incremental distance signals at predetermined incremental distances each less than one of said predetermined equal intervals along said line from said one of said sampling points until a so-created incremental distance signal has said second characteristic signal value; and computing said distance signal as a function of the number of sampling signals preceding said one of said sampling signals and the number of incremental distance signals following said one of said sampling signals.

3,963,867
METHOD FOR INDICATING A FREE-LINE STATE IN A BINARY DATA COMMUNICATION SYSTEM

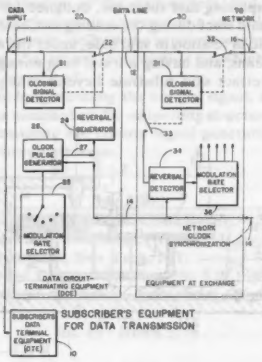
Hendrik Cornelis Anthony Van Duuren, Wassenaar, and Herman da Silva, Voorburg, both of Netherlands, assignors to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, Netherlands

Continuation-in-part of Ser. No. 340,345, March 12, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,474
Int. Cl.² H04L 11/08
U.S. Cl. 178—69 G **9 Claims**

1. In a two-way data telecommunication system between a subscriber's station and an exchange, a method for indicating to the exchange a free-line state to said subscriber's station, comprising:

A. detecting a closing signal to the data communication at both said subscriber's station and said exchange,

B. generating and transmitting a fixed pattern of "1" and "0" bits per byte in response to the detection of said closing signal at said subscriber's station, and

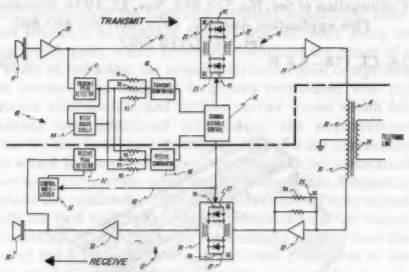


C. detecting said fixed pattern of bits at said exchange for indicating a free and unfaulted line to said subscriber's station.

3,963,868
LOUDSPEAKING TELEPHONE HYSTERESIS AND AMBIENT NOISE CONTROL

Uno Randmere, Victor, and Morris A. Suntop, Rochester, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed June 27, 1974, Ser. No. 483,591
Int. Cl.² H04M 9/08
U.S. Cl. 179—1 HF **7 Claims**



1. For use in a loudspeaking telephone system including transmit and receive channels, a control circuit for switching between said transmit and receive channels, comprising:

a. selection control means responsive to transmit and receive seizure commands for effectively selecting between said transmit and receive channels, respectively, by reducing the gain of the unselected channel,

b. input control means for producing said receive seizure commands and said transmit seizure commands, said input control means including:

c. a first means for deriving a first d.c. input control signal which varies in accordance with the signal level in the transmit channel, and a second means for deriving a second d.c. input signal which varies in accordance with the signal level in the receive channel,

d. transmit comparator means and receive comparator means for producing, respectively, receive and transmit seizure commands,

e. transmit summing junction means connected to operate said transmit comparator means, said transmit summing junction means comprising a first set of at least a first and a second summing impedances connected to a common junction point, the magnitude of impedance of said first summing impedance being larger than that of said second summing impedance, said transmit summing junction means being operative to apply said first d.c. input control signal to said junction point through said first summing impedance and to apply said second d.c. input control signal to said junction point through said second summing impedance, the respective d.c. input control signals being applied to said junction point in opposed d.c. polarity relationship to one another, and

f. receive summing junction means connected to operate said receive comparator means, said receive summing junction means comprising a second set of at least a third and a fourth summing impedances connected to another common junction point, the magnitude of impedance of the third summing impedance being larger than that of said fourth summing impedance, said receive summing junction means being operative to apply said second d.c. input control signal to said another junction point through said third summing impedance and to apply said first d.c. input control signal to said another junction point through said fourth summing impedance, the respective d.c. input control signals being applied to said another junction point in opposed d.c. polarity relationship to one another.

3,963,869

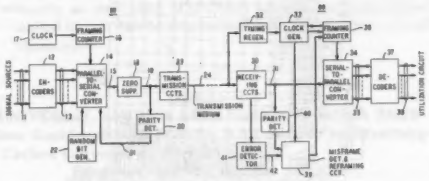
PARITY FRAMING OF PULSE SYSTEMS

James Lewis Caldwell, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 2, 1974, Ser. No. 528,727

Int. Cl.² H04J 3/06

U.S. Cl. 179—15 BS 13 Claims



1. A multiplex pulse transmission terminal comprising:

means for interleaving a plurality of pulse streams into a single pulse stream,

means for dividing said single pulse stream into successive frames of pulses including preselected sequences of pulses from said plurality of pulse streams,

means for inserting a randomly-valued pulse derived independently of said pulse streams into each said frame of pulses,

means for ascertaining the parity of each said frame of pulses, and

means for inserting a parity pulse in each said frame of pulses.

3,963,870

TIME-DIVISION MULTIPLEX SWITCHING SYSTEM

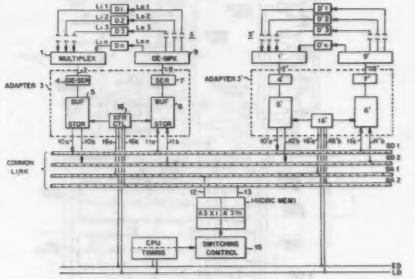
Alain Audre Couder, La Gaude, and Gerald Lebizay, Cagnes-sur-Mer, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1974, Ser. No. 446,044

Claims priority, application France, Mar. 1, 1973, 73.08009

Int. Cl.² H04J 3/00

U.S. Cl. 179—15 AT 10 Claims



1. A switching system for a communications network consisting of a plurality of sub-systems comprising each several devices which transmit and receive information over a transmission multiplex link and a reception multiplex link, said system being characterized in that it includes:

a link common to all sub-systems and comprising a first and a second information buses, a first and a second address buses, and a synchronization bus;

a circulating memory comprising two storage areas in which are sequentially stored the addresses of said devices forming part of different sub-systems and desiring to communicate with one another, said two storage areas being respectively connected to said two address buses to provide coordinate addresses thereto;

one adapter per sub-system to which are connected said transmission multiplex link and said reception multiplex link, and which is itself connected to said two information buses and said two address buses, said adapter comprising means responsive to the address information sent over said address buses by said circulating memory to allow information to be periodically exchanged between two of said devices forming part of two sub-systems via said two information buses.

3,963,871

ANALYSIS DEVICE FOR ESTABLISHING THE BINARY VALUE OF ASYNCHRONOUS DATA SIGNALS

Per-Olaf Thyselius, Tyreso; Burghardt Herman Josef Vollmer, Handen, and Knut Per Johansen, Huddinge, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 5, 1974, Ser. No. 494,701

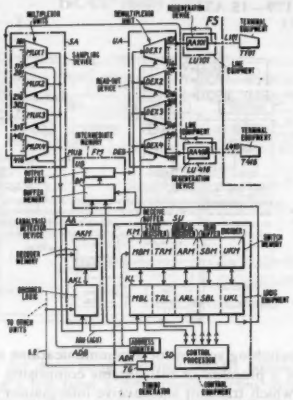
Claims priority, application Sweden, Aug. 10, 1973, 109688/73

Int. Cl.² H04J 3/02; H04B 1/16

U.S. Cl. 179—15 BA 5 Claims

1. Apparatus for indicating the binary value of a data element which is represented by a signal switching from a first state to a second state and, after a duration of time, switches from the second state to the first state, said apparatus comprising: sampling pulse generating means adapted to receive a data element for generating sampling pulses periodically recurring at a rate such that a plurality of such pulses should occur while the signal representing the data element is in the second state, said means having output means for transferring such sampling pulses only while the signal representing the data elements is in the second state; sensing means for indicat-

ing the transition of the signal representing the data element from the first state to the second state; time interval generating means connected to said sensing means and activated thereby for generating a time interval related to a nominal duration of time the signal representing the data element should be in the second state; counting means for counting the number of sampling pulses transferred from said sampling

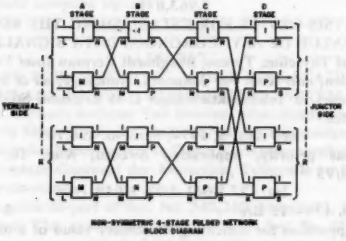


pulse generating means only when the signal representing the data element is in the second state; and binary value signal transmitting means connected to said counting means and said interval generating means for transmitting a particular binary value indicating signal at the end of the time interval generated by said interval generating means only if the number of sampling pulses counted by said counting means during said time interval is greater than a certain value.

3,963,872
NON-SYMMETRIC FOLDED FOUR-STAGE SWITCHING NETWORK

Kenneth Lavern Hagstrom, and Sushil Gajendrarai Munshi, both of Galion, Ohio, assignors to North Electric Company, Galion, Ohio

Filed June 3, 1974, Ser. No. 475,962
Int. Cl.² H04Q 3/52
U.S. Cl. 179—18 GF **19 Claims**



NON-SYMMETRIC 4-STAGE FOLDED NETWORK BLOCK DIAGRAM

1. A non-symmetric folded four-stage switching network comprising a first stage A having K groups of switching matrices, each group being comprised of I-M matrices, a second stage B having K groups of switching matrices, each group in said second stage being comprised of I-N matrices, the matrices of corresponding ones of said groups in said first and second stages A, B being interconnected, a third stage C having K groups of switching matrices, each group in said third stage C being comprised of I-P matrices, the matrices of corresponding ones of said groups K in said second and third stages B, C being interconnected thereby providing a plurality K of ABC switching groups, and a fourth stage D comprising a distribution stage having a plurality of switching matrices, each of which switching matrices in said D stage is interconnected with a matrix in each of said K groups in said C stage, and each of which switching matrices in said D stage is connected to an associated plurality of junctors to provide a folded matrix.

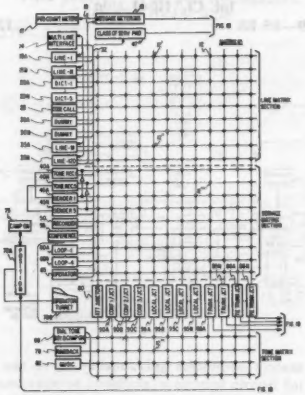
12. A method of searching for an idle path between calling and called terminals in a four-stage folded ABC+D non-symmetric switching network having AB, BC and CD links and junctors comprising the steps of:

a. searching the CD links for a pair of idle CD links which through the D-stage have an idle junctor accessible thereto and which may be connected to extend a path between the calling and called terminals;
b. searching for a path from one of the idle CD links of the pair through the BC and AB links of the ABC stages to the calling terminal;
c. closing the path to the calling terminal; and
d. searching for a path from the other CD link of the pair through the BC and AB links of the ABC stages to the called terminal.

3,963,873
LOCAL TRANSFER ARRANGEMENT FOR ELECTRONIC PRIVATE AUTOMATIC BRANCH EXCHANGE

Uwe A. Pommerening, Webster, and Glenn L. Richards, Caledonia, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,745
Int. Cl.² H04M 3/54
U.S. Cl. 179—18 BD **6 Claims**



1. In a private automatic branch exchange having a solid state switching matrix for connecting calling local stations to called local stations therethrough and including a common control for effecting said connections by a plurality of local junctors having a memory associated with said local junctors, a local transfer arrangement comprising:

holding circuit means, responsive to a local transfer indication from a transferring station connected to a transferred station by a first local junctor, for placing the transferred station in a holding status;

forwarding circuit means, responsive to said local transfer indication, for forwarding said transferring station to a second local junctor while said transferred station is in said holding status;

signaling circuit means, directed by said transferring station while connected to said second local junctor, for signaling a transferee station of an impending local transfer; and

connecting circuit means, responsive to receipt of an impending local transfer signal by said transferee station, for effecting a connection between said transferred station and said transferee station.

3,963,874

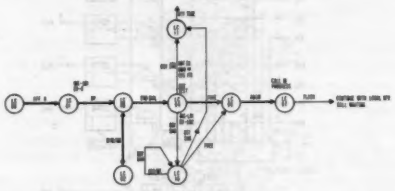
BUSY-TEST ARRANGEMENT FOR ELECTRONIC PRIVATE AUTOMATIC BRANCH EXCHANGE

Uwe A. Pommerening, Webster, and Glenn L. Richards, Caledonia, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,042

Int. Cl.² H04Q 3/54

U.S. Cl. 179—18 AB **15 Claims**



1. In an electronic private automatic branch exchange including a switching matrix for effecting connections between calling and called circuits, each calling and called circuit being associated with a junctor, and a common control for controlling the sequence of operations for the establishment of a call between a calling and a called circuit, the improvement wherein said commmon control includes

a memory, having a prescribed number of storage locations, for storing the number of each respective calling and called circuit associated with a call, and

means, responsive to a request for a connection from a calling circuit to a prescribed called circuit, for scanning said memory and determining whether or not the number of said prescribed called circuit is stored in said memory,

whereby an indication of the busy status of said prescribed called circuit can be determined from the contents of said memory.

3,963,875

UNIVERSAL ANSWER ARRANGEMENT FOR A PABX

Klaus Gueldenpfennig, Penfield, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

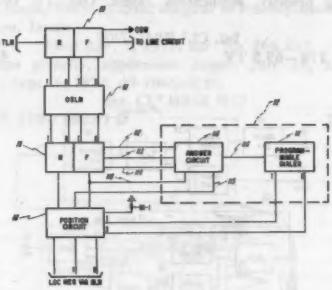
Filed Nov. 4, 1974, Ser. No. 520,828

Int. Cl.² H04M 3/54

U.S. Cl. 179—27 CA **8 Claims**

1. An answer arrangement for use in a private automatic branch exchange having a plurality of trunks each with a first port for connection to a transmission path from one subscriber and a second port for connection to a transmission path to another subscriber, a switching network through which the trunks may be connected to an operator console via a position circuit in the absence of a position busy indication at the position circuit, common control means responsive to service requests from the trunks for marking a trunk for connection through the switching network and further responsive to the service requests for generating request signals, easn of the plurality of trunks having a trunk circuit means which is actuated for connecting the first and second ports to the switching network and which is deactuated for disconnecting the first and second ports from the switching network and interconnecting the two ports within the trunk, the trunk circuit means being initially actuated when its respective trunk is first marked by the connon control means, and an operator circuit means including first and second transmission pairs for connection, respectively, to the first and second ports of a connected trunk, means responsive to a request signal from the common control for connecting the loop circuit through the switching network to the marked trunk, the answer arrangement comprising:

first circuit means for overriding a position busy indication at a position circuit and for permitting a trunk to be connected to the position circuit via the switching network,



second circuit means for inhibiting the transmission of an answer supervision signal from the position circuit to the marked trunk,

third circuit means for utilizing the existing operator circuitry for connecting the marked trunk to a designated destination, and

programmable circuit means arranged to selectively modify the designated destination.

3,963,876

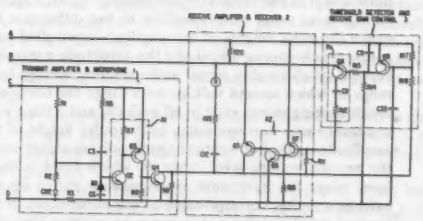
AMPLIFIER CIRCUIT FOR INCREASING TRANSMIT AND RECEIVE LEVELS IN A TELEPHONE HYBRID NETWORK

Roger Edward Holtz, Indianapolis, and Roger Allen Radosevich, Noblesville, both of Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1975, Ser. No. 591,956

Int. Cl.² H04M 1/60, 1/58

U.S. Cl. 179—81 B **18 Claims**



1. Amplifier circuitry for a telephone hybrid network comprising a speech transmit port and a speech receive port having a common terminal with said transmit port, the improvement characterized in that said amplifier circuitry comprises a first amplifier means connected to said transmit port, a second amplifier means connected to said receive port, attenuating means connected to said second amplifier means for attenuating the gain of said second amplifier means, and voice-switching means adapted to supply a control signal to said attentuating means in response to the sum of the amplitude of the speech signals at said receive port and at said

transmit port whereby the amplification of the speech signals by said second amplifier is attenuated for providing sidetone control and gain control.

3,963,877

SYNCHRONIZING SIGNAL TRANSMISSION SYSTEM

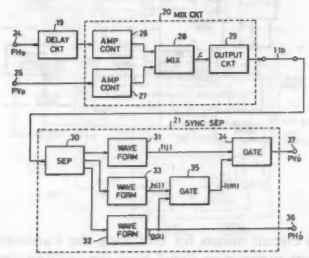
Ken Miyazaki, Tokyo, and Kenji Nakajima, Yokohama, both of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Oct. 7, 1974, Ser. No. 512,608

Claims priority, application Japan, Oct. 11, 1973, 48-113203

Int. Cl.² H04L 7/00

U.S. Cl. 178—69.5 TV 4 Claims



1. A synchronizing signal transmission system comprising:

synchronizing signal generating means for generating a horizontal synchronizing signal and a vertical synchronizing signal;

controlling means for controlling the amplitudes of the horizontal and vertical synchronizing signals respectively thereby to cause the controlled amplitude of the horizontal synchronizing signal to be greater than the controlled amplitude of the vertical synchronizing signal;

mixing means for mixing the horizontal and vertical synchronizing signals controlled in amplitude by said controlling means and for producing a mixed synchronizing signal having a first voltage-level range corresponding to the pulse height of the amplitude-controlled vertical synchronizing signal in which range horizontal synchronizing pulses exist in only a period corresponding to the pulse width of the vertical synchronizing signal, a second voltage-level range corresponding to the difference between the pulse heights of the amplitude-controlled horizontal synchronizing signal and the amplitude-controlled vertical synchronizing signal under the first voltage-level range in which second voltage-level range the horizontal synchronizing pulses exist in all periods, and a third voltage-level range corresponding to the pulse height of the amplitude-controlled vertical synchronizing signal under the second voltage-level range in which third voltage-level range the horizontal synchronizing pulses do not exist in a period corresponding to the pulse width of the vertical synchronizing signal and exist in other periods;

transmission means for transmitting the mixed synchronizing signal thus produced;

first separation means for separating a signal including only the first voltage-level range from the mixed synchronizing signal thus transmitted;

second separation means for separating a signal including only the second voltage-level range from the mixed synchronizing signal thus transmitted to derive the original horizontal synchronizing signal;

third separation means for separating a signal including only the third voltage-level range from the mixed synchronizing signal thus transmitted; and

processing means for processing the output signals of the first, second and third separation means to reproduce the original vertical synchronizing signal.

3,963,878

SIGNAL INTERPRETING SYSTEM FOR FREQUENCY SELECTIVE MULTIFREQUENCY TONE DIALING

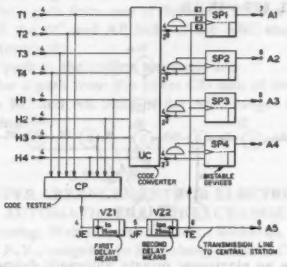
Arthur Kessler, Koppern, Germany, assignor to Telefonbau und Normalzeid G.m.b.H., Frankfurt am Main, Germany

Filed June 26, 1974, Ser. No. 483,470

Claims priority, application Germany, July 6, 1973, 2334426

Int. Cl.² H04M 1/50

U.S. Cl. 179—84 VF 3 Claims



1. A signal interpreting system for frequency-selective multifrequency tone dialing including

a. a code tester (CP) for determining that one and only one frequency of each of two frequency groups is received and a code converter (UC) for converting signals received in a 2×1-out-of-4 signal code into another code, said code tester and said code converter having inputs T1 to T4 and H1 to H4) supplied with signals from signal receivers during the times of reception by said signal receivers of resonant frequencies;

b. a first delay means (VZ1) supplied with an output voltage (JE) from said code tester for the duration of said signals if in a correct 2×1-out-of-4 code, said first delay means having output signals (JF) delayed for fixed predetermined periods of time (*ts*), and said first delay means being adapted to delay only the leading edges of said output signals thereof relative to the leading edges of said output voltage of said code tester and to transmit the trailing edges of said output voltage of said code code tester without delay;

c. a second delay means (VZ2) whose input are said output signals (JF) of said first time delay means (VZ1), said second time delay means having output signals (TE) which start instantly with any input and terminate after a fixed period of time (*tps*) following cessation of said output signals (JF) of said first time delay means (VZ1), said second time delay means being adapted to transmit the leading edge of said output of said first time delay means without time delay and to transmit the trailing edge of said output of said first time delay means with time delay;

d. a plurality of bistable logic elements (SP1 to SP4) supplied with de-coded information from output terminals (2^0, 2^1, 2^1, 2^3) of said code converter (UC), each of said plurality of bistable logic elements having a dynamic input (E2) supplied by said output signals (TE) of said second time delay means (VZ2) and said plurality of bistable logic elements having output terminals (A1–A4) where the inputs thereof remain normally stored and released only in response to the leading edge voltage of said output signals of said second time delay means; and

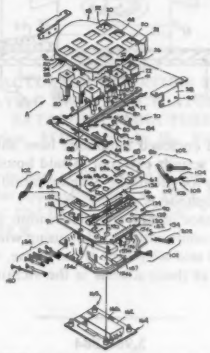
e. a transmission line connected to an output terminal (A5) of said second time delay means (ZV2) for transmitting said output signals (TE) thereof along said transmission line to a central station.

3,963,879

TELEPHONE DIAL ASSEMBLY

Gerhart F. Klaiber, Deal, and Donald Foggia, Oakhurst, both of N.J., assignors to TIE/Communications, Inc., Stamford, Conn.

Filed July 19, 1974, Ser. No. 490,076
Int. Cl.² H04M 1/50
U.S. Cl. 179—90 K 10 Claims



1. A telephone pushbutton dial assembly which comprises:

a. an upper frame including a plurality of apertures arranged in rows and columns and further including a downwardly extending appendage having a plurality of notches and its perimeter;

b. a pushbutton mounted for movement in each aperture, each of said pushbuttons including a plurality of shoulder portions and a singular axially extending appendage;

c. a guide plate including an appendage having the same perimeter as said upper frame appendage and including means for mounting said plate to said upper frame;

d. a plurality of longitudinal and transverse rods, rotatably mounted in a first and second plane, respectively, between corresponding opposite ones of said notches and retained in said notches when said guide plate is mounted to said upper frame, each of said rods including a plurality of appendages transverse to the longitudinal axis of their respective rod, certain ones of said appendages adapted to cause rotational movement of its associated rod through cooperative action with said shoulder portions of corresponding ones of said buttons;

e. first switching means, including a first switching board having at least a first set of switches mounted thereon cooperating with certain other of said appendages and adapted to make or break in response to the rotational movement of the rods; and

f. second switching means including,

i. a second switching board positioned in a plane parallel to and below the plane of said first switching board, said first and second switching boards having a plurality of corresponding openings each aligned with a corresponding one of said axially extending appendages,

ii. a plurality of leaf-spring switches fixedly secured to said second switching board, each of said leaf-spring switches aligned with a corresponding one of said axially extending appendages, each of said leaf-spring switches making an electrical connection between two points of electrical potential on said board, and

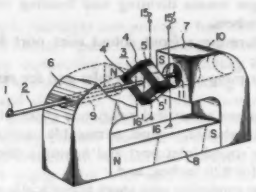
iii. means aligned with each of said axially extending appendages and its corresponding openings in said first and second board, and operatively connected between said appendage and its corresponding leaf-spring switch, whereby said electrical connection is broken when the corresponding push-button is depressed.

3,963,880

MOVING COIL-TYPE CARTRIDGE

Isamu Ikeda, Tokyo, Japan, assignor to Fidelity-Research Inc., Tokyo, Japan

Filed Apr. 9, 1975, Ser. No. 566,247
Claims priority, application Japan, July 24, 1974, 49-85387; Sept. 6, 1974, 49-106568[U]
Int. Cl.² H04R 9/12
U.S. Cl. 179—100.41 D 23 Claims



1. An moving coil-type cartridge comprising a cantilever of a nonmagnetic material and having at an end a stylus, a bobbin made of a nonmagnetic and electrically insulative material including mutually parallel two surfaces and mounted at least adjacent the other end of said cantilever along an axis passing substantially through the center of said two surfaces, at least a pair of coils wound on said bobbin so as to have substantially parallel sections respectively disposed on each of said two surfaces and intersect one another, means of a nonmagnetic material for supporting said cantilever at a fulcrum position thereof for allowing said stylus and bobbin to rotate in synchronism with each other, a magnetic circuit which comprises a permanent magnet and a pair of pole pieces respectively arranged so that one end thereof will be magnetically coupled to each of N-pole and S-pole ends of said permanent magnet and polarized the other end will form a magnetic gap between one another, said bobbin being positioned substantially at the center of said magnetic gap so that the two parallel surfaces will oppose said the other ends of the pole pieces, respectively, and a base member of a nonmagnetic material to which said magnetic circuit is secured at least at said permanent magnet and having an electric terminal connected to both ends of said coils,

said supporting means for said cantilever being fixed to one of said pair of pole pieces so that said fulcrum will be disposed substantially on the axial line of the magnetic gap, and

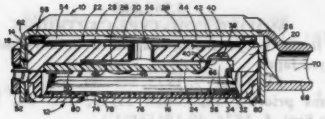
said polarized end at least of the pole piece to which said supporting means is fixed having a cavity expanding in all directions around said fulcrum so that magnetic fluxes flowing in the magnetic gap through the coil bobbin will be distributed as converged in said directions so as to be away from the fulcrum, whereby said sections of the coils on one of the two surfaces of the bobbin on the side remote from the fulcrum will be disposed within the fluxes of a larger range than that of the fluxes in which the other coil sections on the side closer to the fulcrum is disposed and, when the bobbin including the coils is rotated about the fulcrum as a center, said coil sections on the side remote from the fulcrum will transverse the fluxes at a larger velocity than the other coil sections.

3,963,881

UNIDIRECTIONAL CONDENSER MICROPHONE

Freeman W. Fraim, Lexington; Preston V. Murphy, Weston, and Alan P. Woodard, Newtonville, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed May 29, 1973, Ser. No. 364,997
Int. Cl.[2] H04R 1/38, 19/04
U.S. Cl. 179—111 E 21 Claims



2. A miniature unidirectional condenser microphone having a fore and aft orientation, said microphone comprising:

a. a housing;

b. diaphragm means dividing said housing into front and rear chambers;

c. means forming a front sound inlet port for said front chamber;

d. means forming a rear sound inlet port for said rear chamber;

e. a continuous acoustical resistance sheet of non-absorbant, hydrophobic, sound permeable material covering said rear sound inlet port and having a thickness not in excess of 0.020 inches; and

f. means for rendering said sheet acoustically effective over an area thereof significantly greater than the area of said rear sound inlet port.

3,963,882

BORON OR GRAPHITE REINFORCED VOICE COIL AND MANUFACTURING PROCESS

Raymond M. Lewis, Burnsville, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 14, 1975, Ser. No. 558,615
Int. Cl.[2] H01F 5/02, 41/06; H04R 1/00
U.S. Cl. 179—115.5 VC 18 Claims

1. A cylindrically shaped voice coil armature having a conductor helically wound into a hollow, approximately cylindrical shape, a stiffening layer coextensive and coaxial with and snugly fitted to the conductor cylinder and formed of a multiplicity of turns of graphite fiber, and a matrix bonding each of the individual conductor and fiber turns all firmly to all other adjacent conductor and fiber turns.

3,963,883

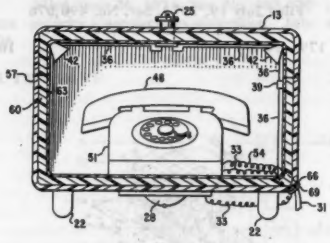
TELEPHONE ENCLOSURE WITH SOUND PREVENTION MEANS

Thomas S. Kulka, 200 Film Bldg., 2108 Payne Ave., Cleveland, Ohio 44114

Filed July 29, 1974, Ser. No. 492,673
Int. Cl.[2] H04M 1/19
U.S. Cl. 179—179 5 Claims

1. An apparatus for preventing the unauthorized use for surveillance purposes of a telephone when said telephone is not in use, wherein said telephone has a base and a handset, comprising:

a. a sound inhibiting housing of sufficient size as to completely enclose said telephone base and handset, said housing including a base portion having an open upper end and a cover mating with said open upper end of said base portion thereby to define therewith an enclosure for said telephone base and handset, said base portion and said cover being constructed of material for acoustically



isolating said enclosed telephone base and handset from reception of sounds external to said housing,

b. signal means for providing a signal to indicate when said enclosed telephone is ringing, and

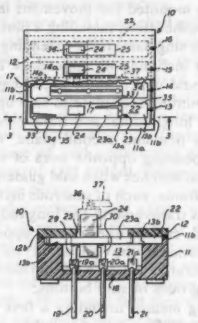
c. signal generator means mounted within said housing for generating sounds within said housing when said housing is closed and said telephone is not in use, so as to prevent surveillance of those sounds in the vicinity of said housing.

3,963,884

MINIATURE MULTIPOLE DOUBLE-THROW SLIDE SWITCH

Robert William Pollock, Manchester, N.H., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 21, 1975, Ser. No. 542,727
Int. Cl.[2] H01H 15/02
U.S. Cl. 200—16 D 3 Claims



1. A miniature slide switch for integrated circuit systems comprising an insulating housing having a shallow height dimension relative to its length and a narrow cavity lengthwise of the housing for an individual single-pole switch, said switch comprising a plurality of terminal pins extending outwardly through the bottom wall of said cavity for plug-in connection with a printed circuit board and projecting into said cavity to provide a plurality of fixed contacts therein lengthwise of the housing, said cavity having also side recesses at the upper end thereof forming a rectangular guideway traversing the cavity parallel to the line of said contacts, an insulating pole-switch holder mounted slidably in said guideway for movement along

said cavity, said holder having a slide-actuator button on its upper side extending through a clearance opening in an upper wall of said housing and having a pair of adjacent parallel stub-like lugs extending from its bottom side downwardly into said cavity, a switch pole having a central bridge portion secured to said holder in a wedged relationship between said lugs and having a pair of spring blades at each end depending from said bridge portion in an inverted V-arrangement, said blades having rounded inwardly-projecting contact faces at their lower ends in line with said terminal contacts and having a spacing therebetween the same as between adjacent terminal pins whereby upon shifting said holder slidably along said guideway into an "on" position said pairs of switch blades are cammed into embracing relation with a pair of said terminal contacts to interconnect the respective terminal pins, and upon shifting said holder from said "on" position said blades are disengaged from said contacts.

3,963,885

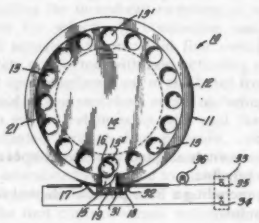
GRAVITY ACTUATED MINIATURE SWITCH FOR WATCH HAVING SWITCH ACTUATOR MAGNETIC RETAINING STRUCTURE

Andre Guy Brien, 3110 Germain St., Fabreville, Quebec, Canada

Continuation-in-part of Ser. No. 438,165, Jan. 30, 1974, abandoned. This application Feb. 4, 1975, Ser. No. 547,042

Int. Cl.² H01H *35/02;* **G04C** *23/00*

U.S. Cl. 200—52 R **12 Claims**



1. A switch device for use in a wristwatch, said device comprising a switch housing; a cavity defined within said switch housing; said cavity having a top wall, a bottom wall and a side wall with at least a portion thereof being arcuately extending; a spherical displaceable element, of magnetically attractable material located for movement within said cavity; said side wall, top wall and bottom wall being spaced apart a distance sufficient to permit free displacement of said displaceable element therebetween; at least one magnetic element associated with said cavity and located in a portion of said side wall whereby to retain said spherical displacement element thereto by magnetic attraction when said spherical element is displaced thereagainst in said cavity, said spherical element, when retained by said magnetic element, being dislodged therefrom by an external force created by a predetermined movement of a wearer's arm to release said spherical element in said cavity by gravity, and switch contact means in said arcuately extending portion of said side wall and actuable by said spherical displaceable element when in contact therewith and when said wristwatch is in a particular position.

3,963,886

SWITCH FOR FLASHLIGHT

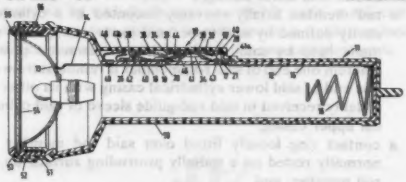
Ting Shen Yen, 40, Bedford Road, 7th Floor, Taikoktsui, Kowloon, Hong Kong

Filed Dec. 4, 1974, Ser. No. 529,278

Claims priority, application United Kingdom, Sept. 10, 1974, 39500/74

Int. Cl.² F21V *23/04;* **H01H** *1/34*

U.S. Cl. 200—60 **8 Claims**



5. An electric flashlight comprising a first circuit contact, a second circuit contact spaced from said first contact, a switch for selectively connecting and disconnecting said first and second circuit contacts, said switch including a casing having spaced end and side walls, a leaf spring forming the switch contact strip pivoted intermediate its ends on said casing to form a first spring portion movable into and out of engagement with said first circuit contact and a second spring portion in permanent engagement with said second circuit contact, spaced protuberances on said spring which engage the inner surfaces of said casing end walls, the distance between said end walls being less than the distance between said protuberances which causes flexture of said spring, and nonlatching actuating members operative on said spring to selectively effect said movement of the first spring portion into and out of engagement with said first circuit contact.

3,963,887

PRESSURE-RESPONSIVE SWITCH DEVICE FOR PNEUMATIC TIRES

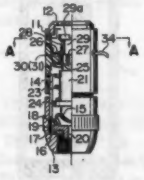
Takashi Takusagawa, Ome; Akira Fujikawa, Kodaira; Akira Matsuda, Higashimurayama; Masaaki Kaida, Kodaira, and Shigeo Yasuda, Musashino, all of Japan, assignors to Bridgestone Tire Company Limited and Mitaka Instrument Company Limited, both of Tokyo, Japan

Filed Aug. 1, 1974, Ser. No. 494,347

Claims priority, application Japan, Sept. 20, 1973, 48-109964[U]; Sept. 20, 1973, 48-10965[U]

Int. Cl.² H01H *35/34*

U.S. Cl. 200—83 L **18 Claims**



6. A pressure-responsive switching device for pneumatic tires, comprising:

a pneumatic tire;

a cylindrical upper casing of an insulating material;

a spring retainer of a conductive material having a skirt portion threaded into one end of said cylindrical upper casing and a rod-guide sleeve formed axially thereof;

a cylindrical lower casing of a conductive material having one end internally threaded for connection to an air valve attached to said pneumatic tire;

a cylindrical connecting member of a conductive material having opposite ends thereof securely fitted into the other ends of said upper and lower casings and having an annular contact surface;

a diaphragm securely mounted in said lower casing and having one side thereof held in communication with the internal air pressure of said tire through a valve core depressing member disposed at the internally threaded end of said lower casing;

a rod member axially movably mounted in a cylindrical cavity defined by said upper and lower casings and normally held by said diaphragm in a retracted position wherein one end of said rod member is remotest from said one end of said lower cylindrical casing with its other end slidably received in said rod-guide sleeve of said cylindrical upper casing;

a contact ring loosely fitted over said rod member and normally rested on a radially protruding surface on said rod member; and

a conical compression spring mounted in a prestressed state between said spring retainer and said contact ring for urging said rod member toward said diaphragm;

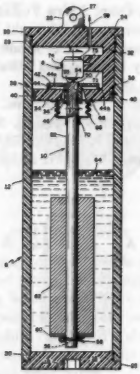
said rod member being moved from said retracted position into a protruded position by the action of said conical spring when the internal pressure of said pneumatic tire drops below a predetermined level, said one end of said rod member being nearest from said one end of said lower casing inversely deflecting said diaphragm and securely closing said contact ring on said annular contact surface of said connecting member to complete a power circuit of a warning device.

3,963,888

MULTI-ANGLE TILT SWITCH DEVICE WITH ADJUSTABLE OSCILLATING CONTROLLER

John R. Riede, White Bear Lake, Minn., assignor to Riede Systems, Inc., Minneapolis, Minn.

Filed Feb. 28, 1975, Ser. No. 554,315
Int. Cl.² H01H *35/14*
U.S. Cl. 200—61.48 **2 Claims**



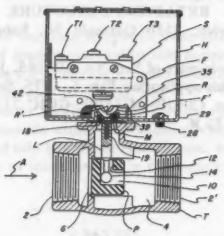
1. A tilt switch device comprising an elongated casing, a circular disc provided with a downwardly directed flange having a semicircular peripheral knife edge, said disc having a centrally threaded vertical passage extending completely therethrough, a rod having its upper end portion threadedly received in said passage to permit vertical adjustment of said rod with respect to said disc, said rod extending downwardly from said disc, a weight member carried by said rod adjacent its lower end, a platform fixedly located in the upper portion of said casing for supporting the peripheral knife edge of said disc, said platform having a hole through which said rod depends downwardly, a switch unit having an operating member disposed generally above the center of said disc, the upper end of said rod being engageable with said operating member so that when said disc is rocked relative to said platform said operating member is actuated by said rod end to operate said switch unit, and a damping fluid contained in the lower portion of said casing to retard relative movement of said weight member.

3,963,889

LOW VELOCITY FLOW SWITCH

Elwood Harold Stonich, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 30, 1974, Ser. No. 493,039
Int. Cl.² H01M *35/40*
U.S. Cl. 200—81.9 R **7 Claims**



1. In a flow switch adapted to respond operatively to fluid flowing in a pipeline,

a housing including a base portion adapted for connection to a pipeline,

said base portion including an opening for communication with the interior of a pipeline,

first lever means extending through said opening to enable a first end of the lever means to be positioned in the interior of a pipeline and a second end to be positioned within the housing,

pressure responsive means supported on said first end of the lever means to establish contact with fluids and move in response to fluid flow,

flexible seal means including an outer edge sealed to said base portion, flexible seal means including an opening through a central portion enabling said lever means to extend therethrough and providing a seal preventing fluids from entering said housing,

rocker means, including a pivot bearing, coupled to the second end of said lever means to enable motion of said first end to be transmitted by the second end,

pivot bearing means integral to a bracket fastened in said housing in engagement with said pivot bearing to provide a fulcrum about which the first lever means may rotate,

second lever means fastened at one end to said rocker means, and

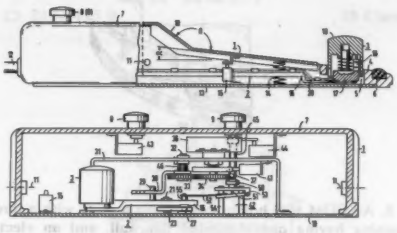
a switch assembly including a plunger operated switch unit mounted on said bracket,

said second lever means responding to motion imparted through said first lever means to the rocker means to operate said plunger.

3,963,890
FOOT OPERATED SWITCH ASSEMBLY WITH LATCHING STRUCTURE FOR OPERATOR

Reinhard Straihammer, Kirschhausen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed June 19, 1973, Ser. No. 371,543
Claims priority, application Germany, June 26, 1972, 2231266
Int. Cl.² H01H 3/14; G05G 1/14
U.S. Cl. 200—86.5 11 Claims



1. A foot control installation for drives and the like, comprising a housing; actuating means supported in said housing and having an end portion projecting therefrom, said actuating means being movable between an initial inoperative position and at least one operative position; foot contact means being mounted on the projecting portion of said actuating means; a control element for said drive being operatively connected to said actuating means; first and second switching means for effecting the in-and-out switching of said drive; a selector switch for selectively connecting said switching means to said actuating means; said first switching means being operatively connected with said actuating means so as to be actuated upon displacement of the latter from its initial position, and said second switching means including an actuating element in spaced relationship with said first switching means and actuated through foot pressure, said actuating element for said second switching means including a foot pressure plate articulatedly fastened to said housing and positioned at the upper surface thereof, said pressure plate, as viewed from the foot contact means, extending towards the opposite end of said housing, said pressure plate being located proximate the path of movement of said foot contact means defined by the displacement of said actuating means from its initial position into its operative end positions, means in said housing for biasing said actuating means into its initial position; and a locking arrangement in said housing for arresting said actuating means in its operative end position upon pressure being exerted on said foot contact means.

3,963,891
CHOKED CONDITION DETECTOR FOR AN AIR-PURIFYING DEVICE

Maurice de Magondeaux, Neuilly-sur-Seine, France, assignor to Sofiltra, Societe Industrielle de Filtration, Courbevoie, France

Filed Oct. 2, 1974, Ser. No. 511,106
Claims priority, application France, Oct. 3, 1973, 73.35328
Int. Cl.² H01H 3/00; G01D 13/00
U.S. Cl. 200—308 6 Claims

2. A device for detecting the choked condition of an air purifier for a combustion engine, the device comprising, in combination:

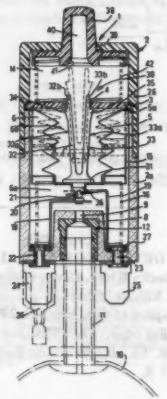
a casing having a wall including a transparent portion and an opaque portion;

a transverse partition mounted within the casing and defining an opening;

a flexible diaphragm carried by the transverse partition, the diaphragm dividing the interior of the casing into first and second compartments;

means for supplying the pressure within said purifier to the first compartment, the second compartment being exposed to a reference pressure;

an indicator connected to the diaphragm within the casing, the indicator being normally located in a nonvisible position adjacent the opaque portion of said wall but being movable by said diaphragm to a visible position adjacent said transparent portion in response to a predetermined difference in pressure between the two compartments;



switch means located in the first compartment in position to be actuated by the diaphragm, the switch means being movable between an open position and a closed position; and

locking means for releasably maintaining the indicator in its visible position and the switch means in its closed position, the locking means including a control knob and a resilient member connected to the diaphragm, the control knob being movably mounted on the casing in position to engage the resilient member.

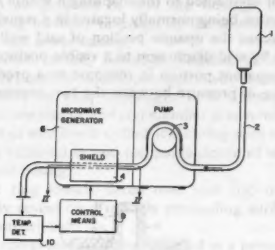
3,963,892
CONTROLLING THE MICROWAVE HEATING OF FLOWING BLOOD AS A FUNCTION OF HEATED BLOOD TEMPERATURE

Sven Erik Camph, Hollviksnas, and Kjell Ake Bertil Holmgren, Trelleborg, both of Sweden, assignors to Camph Engineering Company AB, Malmo, Sweden

Filed June 13, 1973, Ser. No. 369,437
Claims priority, application United Kingdom, June 14, 1972, 27759/72
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 M 1 Claim

1. A method of heating blood for on line use directly into a patient, characterized by the steps of introducing a continuous flow of blood into a shield chamber through a microwave preamble flexible hose to pass therethrough, exposing the blood flowing within said chamber to the heating action of microwaves, and controlling the duration of exposure and

energy of the microwaves from the microwave generator in response to the temperature of the blood which has passed



through said chamber so that the blood is heated to the desired temperature.

3,963,893

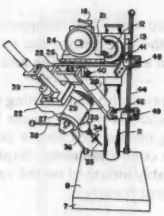
ADJUSTMENT DEVICE FOR METAL DISINTEGRATORS

Jere H. Roach, Rocky River, Ohio, assignor to Cammann Mfg., Co., Inc., Bay Village, Ohio

Continuation-in-part of Ser. No. 541,270, Jan. 15, 1975. This application Mar. 17, 1975, Ser. No. 558,894

Int. Cl.² B23K *9/16*; B23C *1/12*

U.S. Cl. 219—69 R 14 Claims



1. An adjustment device for mounting a disintegrator head to a support, comprising in combination:

a first housing;

means for mounting said first housing to the support;

a second housing;

means for mounting the disintegrator head to said second housing;

one of said first and second housings having a mounting member and a plate member;

means for relatively journaling said mounting member and said plate member about a first axis;

hinge means interconnecting said first and second housings for enabling movement between said first and second housings about a hinge axis substantially perpendicular to and offset from said first axis;

and locking means for locking the position on said hinge axis of said first housing relative to said second housing.

3,963,894

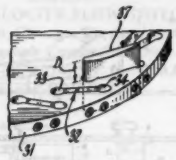
TURBINE-NOZZLE MANUFACTURING APPARATUS

Richard L. Wachtell, Tuxedo Park, and Edward C. Palmenberg, Nanuet, both of N.Y., assignors to Chromalloy American Corporation, Orangeburg, N.Y.

Division of Ser. No. 436,369, Jan. 24, 1974, Pat. No. 3,920,947, which is a continuation-in-part of Ser. No. 221,306, Jan. 27, 1972, Pat. No. 3,802,046. This application Apr. 14, 1975, Ser. No. 567,553

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 E 5 Claims



1. An EDM tool holder comprising a plate with a through opening having one elongated flat wall, and an electrode element of predetermined airfoil section accommodated in said opening with at least one end of the span dimension of said element projecting outside said plate, a portion of a convex surface of said section having a flat-bottomed recess in the region of reception in the opening, the flat bottom of said recess abutting said flat wall, and clamp means acting between said plate and said element for holding a firmly referencing abutment of said flat bottom and wall surfaces.

3,963,895

DEVICE FOR EFFECTING THE GUIDING AND OSCILLATION MOVEMENTS OF A WELDING HEAD EQUIPPED WITH AN ELECTRODE-CARRIER NOZZLE

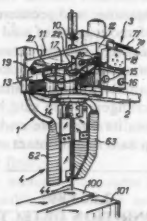
Jean Maurice Hennion, Saint-Nazaire, France, assignor to Fives-Cail Babcock S.A., Paris, France

Filed Dec. 18, 1973, Ser. No. 425,846

Claims priority, application France, Dec. 21, 1972, 72.45579

Int. Cl.² B23K *9/12*

U.S. Cl. 219—125 R 29 Claims



1. Tool-holding apparatus for the reciprocated coursing of a welding-electrode or the like tool element between lateral limits of the bottom of a channel during the longitudinal progression of the holder along the channel, said apparatus including a tool-supporting element of smaller transverse extent than the channel at the region of holder insertion into the channel, said apparatus comprising a frame with means supporting the tool-holder element for tool-element insertion in the channel and for transversely guided reciprocation between the channel walls, drive means for imparting successive transverse reciprocating displacements to said tool-holder element in opposite directions with respect to said frame, means responsive to tool-supporting-element contact with a channel wall and effective to arrest motion of said drive means upon

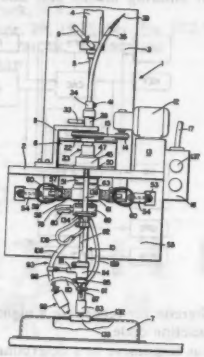
attainment of each limit of transverse reciprocation, and means operative to establish a predetermined dwell of said electrode-holder element at each arrested limit of transverse reciprocation.

3,963,896

ROTARY WELDING EQUIPMENT WITH CONSUMABLE ELECTRODE WIRE

Corwin E. Lucas, Alliance, Ohio, assignor to Standard Alliance Industries, Alliance, Ohio

Filed Feb. 24, 1975, Ser. No. 552,553
Int. Cl.² B23K 9/12
U.S. Cl. 219—125 R 19 Claims



1. Rotary welding equipment including support means; spindle means rotatably mounted on the support means, said spindle means having an open first end and a second end; a bore formed in a portion of the spindle means extending from the open first end of the spindle means; opening means formed in the spindle means and communicating with the bore of the spindle means; means for rotating the spindle means; workpiece centering means mounted on the second end of the spindle means; a welding tip; means for mounting the welding tip on the spindle means offset from the axis of rotation of the spindle means; means providing a passage for supplying consumable electrode weld wire through the spindle means first end, through the bore and opening means of the spindle means, and through the welding tip mounting means to the welding tip; commutator means mounted on the spindle for electrically connecting the welding tip in an arc power circuit; fluid cooling means operatively connected to the spindle means and extending to at least adjacent the welding tip for circulating fluid to cool the welding tip and to cool the spindle means; and means for supplying arc shielding gas to the welding tip.

3,963,897

ELECTRICALLY HEATED SOLDER REMOVING BIT

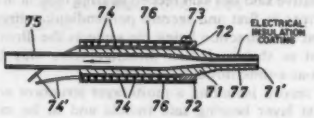
Katumasa Wakita, Yokohama; Issei Yunoki, and Mitunari Yoshida, both of Tokyo, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 289,562, Sept. 15, 1972, Pat. No. 3,842,240. This application May 9, 1974, Ser. No. 468,368
Claims priority, application Japan, Sept. 17, 1971, 46-84514[U]; Oct. 4, 1971, 46-91013[U]; Jan. 13, 1972, 47-6428[U]; Sept. 27, 1971, 46-75310
Int. Cl.² B23K 3/02; H05B 1/00
U.S. Cl. 219—230 3 Claims

1. A solder removing bit for use in melting solder by the heat of the bit and for removing the melted solder, comprising:

an elongated hollow suction pipe having a suction bore extending through its length; said suction pipe having an open end serving as an inlet to said bore, and a portion of said pipe defining an end portion extending toward said open end;

a metallic bit substantially completely surrounding said pipe end portion; a heater connected in heat exchange relation



with said bit and spaced from said open end to define an end portion on said bit;

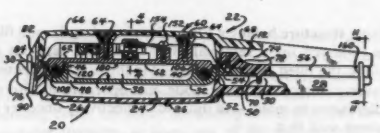
said end portion of said bit being coated with an electrically insulative material completely from said open end to said heater.

3,963,898

ELECTRIC COOKING APPLIANCE

Clayton K. Tuckwell, Eau Claire, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.

Filed July 7, 1975, Ser. No. 593,573
Int. Cl.² H05B 1/00; A47J 37/00; B29C 3/00
U.S. Cl. 219—524 13 Claims



1. An electric appliance for simultaneously cooking hamburgers and the like on both sides while removing the separating grease as the hamburger cooks, said appliance comprising a concave base and a separable cover thereover, both said cover and concave base being of heat insulating material, a pan of heat conductive metal having a heat insulated handle, said pan embodying a concave cooking portion having a surrounding wall portion and a continuous channel outwardly of and about said wall portion, said pan being removably seated within the cover-facing side of the base with its concave cooking portion spaced off the bottom wall of the base and its heat insulated handle extending outwardly of the base, said concave cooking portion having apertures in its bottom wall inwardly of said surrounding wall portion through which grease drains during cooking for collection therebelow in the concave base, the cover supporting a cooking element of heat conductive metal on its underside, said cooking element having a surrounding depending rib which received within said channel in close proximity therewith when the cover is closed against the base, the rib containing an electrical heating element in effective heat transfer relation therewith, and releasable locking means on the cover and base for firmly holding of the cover in engaged heat conductive relation with portions said rib against the base of the channel when the cover is closed against the base, the single heating element thereby simultaneously heating the pan and the cooking element of the cover.

3,963,899

VOTING MACHINE

John MacDuff, 232 Astor Court, Villa Park, Ill. 60181

Filed May 9, 1975, Ser. No. 576,145
Int. Cl.² G07C 13/00
U.S. Cl. 235—50 B 11 Claims

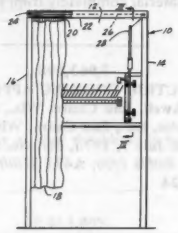
1. A voting machine comprising: an enclosure;

a panel mounted in said enclosure including a front surface and a rear surface and having a slot therein;

a movable door mounted adjacent said panel and movable to cover and uncover said slot;

a record mounted adjacent said rear surface for movement relative said slot said record bearing indicia in rows thereacross in first and second perpendicular directions, said first row direction being the same as the direction of said slot so that such first direction rows may be revealed on-at-a-time through said slot;

said record including a multi-layer structure comprising a first layer bearing said indicia and to be marked by a voter, a second layer responsive to making pressure on said first layer to produce corresponding makings, a tear-out section along each row to the first direction to receive the voter markings, and an aperture through said multi-



layer structure having a filling therein, wherein said filling is removed upon removal of each of said tear-out sections, the filled apertures aligned in the second direction;

a lever connected to said door and operable in alternate directions to move said door to respectively uncover and cover said slot;

switch means mounted adjacent said multi-layer structure in the area of said apertures including switch contacts and a member movable toward and away from said structure, said member operated by said lever to move said member against said multi-layer structure and through an aperture to operate said switch contacts when a tear-out section has been removed; and

a latch mechanism connected to and operated by said switch contacts to prevent opening of said door when a row with a tear-out section removed is aligned with said slot.

3,963,900

NIGHT DEPOSITORY CONTROL SYSTEM

Yoji Sawaguchi, Tokyo, and Katsumasa Ogawa, Yokohama, both of Japan, assignors to Fujitsu Ltd., Japan

Filed Sept. 30, 1974, Ser. No. 510,755

Claims priority, application Japan, Sept. 28, 1973, 48-108994

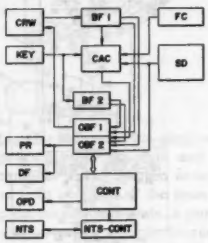
Int. Cl.² G06K 5/00, 7/00; H04N 9/00

U.S. Cl. 235—61.7 B **4 Claims**

1. A night depository control system for use with an automatic banking transaction system providing at least one of cash dispensing and depositing functions and employing a card having data recorded thereon including at least a coded identification of a customer account for the customer to whom the card is issued and a transaction code identifying each type of transactions authorized for that customer account, the transaction system including means for reading data from the card, means operable, by the customer, for entering the type of transaction desired, data concerning the transaction, and a secret number corresponding to a given customer account, means for authorizing the customer to perform a transaction, said authorizing means including means for determining the existence of a predetermined relation of the entered transaction type and the authorized transaction type recorded on the card and for determining the existence of a predetermined relation of the secret number entered by the customer and the coded identification of the customer account read from the card, means for issuing a receipt for a transaction when authorized and performed by the transaction system, and means for storing data concerning the transaction in accordance with data read from the card and data entered by the customer, said night depository control system including

night depository apparatus being selectively controllable from a state of non-acceptance to a state for acceptance of a deposit, to enable placement of a deposit in said apparatus,

said transaction entering means including a night depository transaction entering means and said card including a



position thereon for recording a night depository authorized transaction code,

control means responsive to a determination by said determining means of the entry of an authorized night depository transaction code, for controlling said night depository apparatus to said state for acceptance of a deposit for permitting placement of a deposit therein,

means for detecting placement of a deposit in said night depository apparatus and for issuing a deposit detection signal in response thereto, and

said control means responding to the deposit detection signal to actuate said receipt issuing means for issuing a receipt for the deposit to the customer and to enable said storing means for storing the data concerning the transaction entered by operation of said data entering means by the customer.

3,963,901

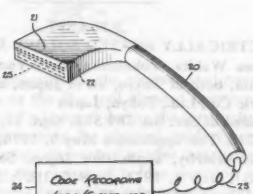
DATA PROCESSING SYSTEM

James Constantine Gevas, Roseland, N.J., assignor to Intelcom Industries Incorporated, San Diego, Calif.

Filed Aug. 26, 1974, Ser. No. 500,512

Int. Cl.² G06K 7/08, 19/06

U.S. Cl. 235—61.11 D **15 Claims**



1. A data processing system for recording data in machine readable form in a recording medium in multiple parallel spaced apart channels and reading said data from said medium with a scanning sensor, characterized by a sensor for scanning

simultaneously said parallel channels in said recorded medium at least in the general direction of said parallel channels but with less than perfect spatial restraint, means coupled to said sensor responsive to signals detected thereby in said parallel channels for determining when signals have been detected in all of said channels, and means activated by said last mentioned means for reading the data from all of said channels in spite of any shifting relative registration and skew between said sensor and said recorded medium.

3,963,902

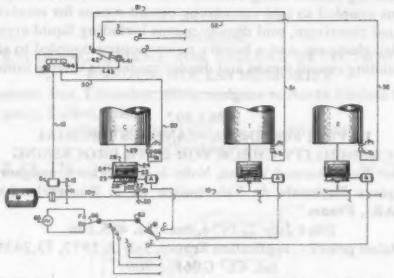
METHOD AND APPARATUS FOR PRE-REGISTRATION OF A MULTIPLE CYLINDER ROTARY PRINTING PRESS

Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,727

Int. Cl.² G06M *3/00*

U.S. Cl. 235—92 MP **9 Claims**



1. A method of setting, to a predetermined order, the rotational phase relationship between a plurality of rotating elements having a precise rotational ratio relationship with a common rotary power transmission line, each of said rotating elements having a rotational phase angle adjusting mechanism disposed between said common transmission line and the respective rotating element, said method comprising the steps of:

A. Rotatively driving said rotating elements with said rotary transmission line;

B. Generating a large, finite number of pacing pulse signals respective to each revolution of said rotary power transmission line;

C. Generating a reference pulse signal for each revolution of each rotating element when a respective rotating element passes a predetermined fixed angular position;

D. Selecting the reference pulse signal respective to a first of said rotating elements as a starting signal;

E. Digitally accumulating with counting means the number of said pacing pulses emitted from the instant of said start signal generation.

F. Stopping said pacing pulse accumulating when a reference pulse signal is generated from a respective second rotating element.

G. Comparing the total number of pacing pulses accumulated between said starting and stopping reference pulse signals to a predetermined quantity which relates uniquely to the desired registration alignment of said first and second rotating elements within the full rotative cycle thereof; and,

H. Shifting the angular relationship of said second rotating element relative to said first rotating elemet until the digital accumulation of said total number of pacing pulses substantially equals said predetermined quantity.

3,963,903

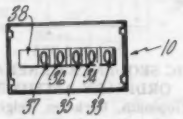
RESETTABLE COUNTING MECHANISM

Dominick Anthony Pirro, Avon, and Paul Levere Kennedy, Meriden, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,489

Int. Cl.² G06C *15/42, 25/02*

U.S. Cl. 235—144 R **11 Claims**



1. In a resettable counting mechanism having a frame, a wheel shaft supported for resetting rotation relative to the frame and having a pawl-engaging slot therein, a set of coaxial number wheels rotatably mounted on said shaft in side-by-side ascending order for count advancing rotation in one direction of angular rotation, at least one of the higher order wheels including reset pawl means for detenting engagement with said slot in said shaft in one direction of angular rotation at a relative angular positioning corresponding with a zero reset position when said shaft is at its reset position, transfer pinions for transferring the count between adjacent number wheels, selectively actuable means for driving the lowest order wheel of said set; the improvement wherein said shaft includes a detenting member fixedly connected thereto and extending transversely thereof and a detent seat is operatively positioned and stationary relative to said frame for releasably retaining said detenting member and said shaft at the reset rotational position.

3,963,904

MODELING WITH A MANUALLY INTERACTIVE COMPUTER CONSTRAINT VIOLATION MONITORING MEANS

Wilfred Norman Blackwood; Finbar Joseph Gallagher, both of Dundalk; Kenneth Rutherford Richey, Bangor, and William Marshall, Belfast, all of Ireland, assignors to Oeleq Limited, Dundalk, Ireland

Filed Dec. 4, 1974, Ser. No. 529,636

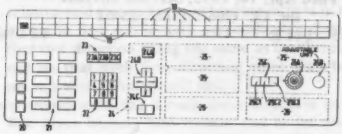
Claims priority, application United Kingdom, Dec. 7, 1973, 56922/73

Int. Cl.² G06F *15/06;* G06G *7/48*

U.S. Cl. 235—152 **5 Claims**

1. A computing system having a computing section for computing according to a predetermined programme, an input unit coupled to feed information into said computing section and a display unit coupled to said computing section to display information contained therein, and wherein said input unit includes first means to apply to said computing section quantities representative of predetermined values of problem constraints, second means to apply to said computing section quantities representative of the initial conditions of

variables of said information, manually-actuable third means to vary the value of the quantity representing a designated variable from its initial condition, and monitoring means having a warning element responsive to the occurrence during



computation of a computed value equal to the predetermined constraint value applied by said first means, the monitoring means being effective during actuation of the manually-actuable third means to permit evaluation of the problem undergoing computation.

3,963,905

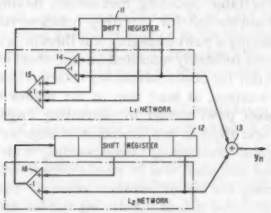
PERIODIC SEQUENCE GENERATORS USING ORDINARY ARITHMETIC

Bhaskarpillai Gopinath, Berkeley Heights, N.J., and Robert Paul Kurshan, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 504,858, Sept. 11, 1974, abandoned. This application May 2, 1975, Ser. No. 573,962

Int. Cl.[2] G06F *7/38*

U.S. Cl. 235—152 **16 Claims**



1. A circuit comprising:

a shift register;

means for multiplying the output signals of selected stages of said shift register by predetermined integers to cause the characteristic function of said circuit to be a cyclotomic polynomial;

means for forming a non-modulo sum signal of said integer multiplied signals; and

means for applying said sum signal to the first stage of said shift register.

3,963,906

COMPACT ELECTRONIC CALCULATOR

Katsumi Yamamura; Kouji Kakizawa, and Minoru Hosokawa, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

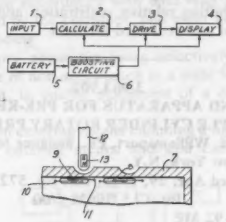
Continuation of Ser. No. 199,189, Nov. 16, 1971. This application Nov. 9, 1973, Ser. No. 414,477

Claims priority, application Japan, Nov. 17, 1970, 45-100708

Int. Cl.[2] G06F *15/2*

U.S. Cl. 235—152 **4 Claims**

1. A compact electronic calculator comprising input circuit means having a base plate formed with an operative surface on an outer side thereof, said operative surface having a plurality of recesses formed at predetermined locations thereon, a reed switch positioned on an inner side of said base plate adjacent each of said predetermined locations on said base plate, and a permanent magnet unconnected to said base plate and manually manipulatable by a user toward and away from said recesses, said permanent magnet actuating only the reed switch associated with the recess in which it is received, said reed switch returning to its unactuated state upon removal of said permanent magnet; calculating circuit means coupled to



said input circuit means for receiving signals therefrom, said calculating means being formed from an LSI circuit; display means coupled to said calculating circuit means for receiving a signal therefrom, said display means including liquid crystal display elements; and a battery power source coupled to said calculating circuit means and display means for driving same.

3,963,907

DEVICE FOR INSTANTANEOUS DECIMAL CREDIBILITY CHECK FOR DATA PROCESSING

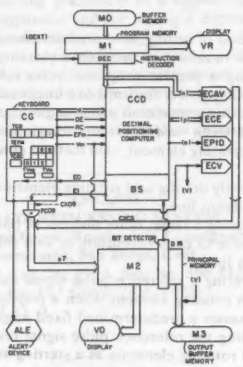
Robert Rene Durand-Vienne, Noisy-le-Roi, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed July 2, 1974, Ser. No. 485,146

Claims priority, application France, July 3, 1973, 73.24393

Int. Cl.[2] G06F *11/00*

U.S. Cl. 235—153 B **3 Claims**



1. A device for instantaneous decimal credibility checking of digital numerical data, comprising:

a. a program memory for storing a program comprising a sequence of instruction characters, said program memory including decoders for decoding the instructions characters;

b. a principal memory for storing numerical data and service characters therein; said principal memory including a bit detector for detecting the contents of the penultimate memory position thereof;

c. a plurality of service character transmitters including blind code transmitter means for filling n memory positions in said principal memory with *n* blind codes, space

code transmitter means for filling *p* memory positions following said *n* memory positions in said principal memory with *p* space codes, decimal point character transmitter means for filling a memory position in said principal memory with a decimal point character, and flag character transmitting means for filling the last memory position in said principal memory with a flag character;

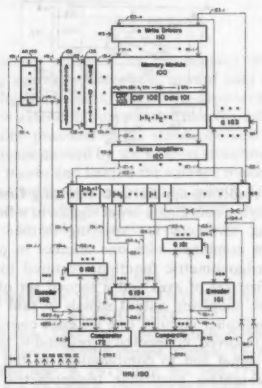
d. a keyboard having a plurality of keys operable for developing control signals and numerical character signals representative of numbers; and

e. a decimal positioning computer comprising decimal positioning means responsive to outputs of said program memory decoders and receptive of a keyboard control signal representative of the maximum integer position of a decimal number to be stored in said principal memory and a sequence of keyboard numerical character signals representative of the digits of said decimal number to be stored in said principal memory for enabling said decimal point character transmitter means to fill a memory position in said principal memory at the proper position of said sequence of keyboard numerical characters as said numerical characters are stored in said principal memory.

3,963,908
ENCODING SCHEME FOR FAILURE DETECTION IN RANDOM ACCESS MEMORIES

Santanu Das, Columbus, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Feb. 24, 1975, Ser. No. 552,304
Int. Cl.² G06F *11/10*
U.S. Cl. 235—153 AM **14 Claims**



1. A method for detecting errors in a digital information storage system, said system including memory means, wherein said memory means includes a plurality of individually-addressable words and wherein each individually-addressable word is further comprised of a data field, a first code field related to the data field, and a second stored code field related to the address at which the word is located, and reading means for extracting said words, said method comprising the steps of:

a. extracting, via said reading means, one of said words;

b. generating a first check code field suitable for use in detecting all multiple unidirectional errors in the data field of said extracted word;

c. generating a second check code field suitable for use in detecting at least a single error in the address of said extracted word;

d. comparing said first stored code field with said first check code field;

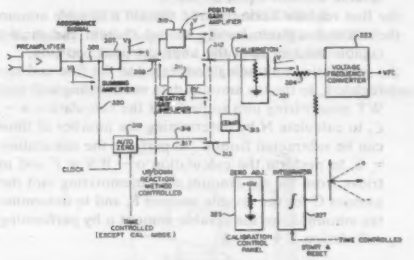
e. comparing said second stored code field with said second check code field;

f. and generating an error indication whenever said stored code fields are not identical to their corresponding generated check code fields.

3,963,909
METHOD AND APPARATUS FOR COMPUTATION IN A KINETIC ANALYZER

John G. Atwood, Redding, and Peter H. Heinz, Trumbull, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 22, 1974, Ser. No. 499,616
Int. Cl.² G06G *7/18*; G01N *21/22*; G01J *3/42*
U.S. Cl. 235—151.35 **34 Claims**



17. Apparatus for computing the reaction rate in a sample cell from a signal proportional to absorbance therein, comprising:

a. means for establishing an observation period;

b. means for integrating the absorbance signal in a first direction during the first half of said observation period;

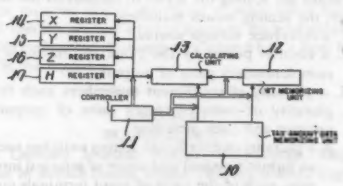
c. means for integrating the absorbance signal in the opposite direction during the second half of said observation period; and

d. means for determining the difference between the two integrations, said difference being proportional to both the average change in the absorbance signal and the reaction rate in the cell over said observation period.

3,963,910
AUTOMATIC TAX CALCULATING APPARATUS

Akio Enomoto, 237-3, Ohhito, Ohhitocho, and Yuji Tadakuma, 80-Z, Mifuku, Ohhitocho, both of Tagata, Shizuoka, Japan

Filed Aug. 5, 1974, Ser. No. 494,879
Claims priority, application Japan, Aug. 10, 1973, 48-89715; Aug. 10, 1973, 48-89716; Aug. 10, 1973, 48-89717
Int. Cl.² G06F *7/38*
U.S. Cl. 235—156 **4 Claims**



1. An automatic tax calculating apparatus for automatically calculating a tax amount for a taxable amount in a tax system having an unproportional portion for taxable amounts up to a predetermined value where tax amounts are unproportionally set and a proportional portion for taxable amounts greater than the predetermined value where tax amounts are proportionally and repeatedly set comprising:

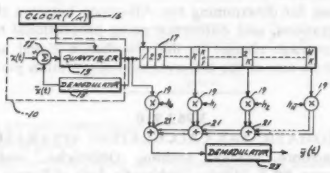
a tax amount data memorizing unit,
a WT memorizing unit,
a calculating unit,
a first register,
a second register,
the tax amount data memorizing unit having stored therein the maximum taxable amounts of each stage of the unproportional portion and the corresponding tax amounts and the maximum taxable amounts of each stage of the lowest range of the proportional portion and the corresponding tax amounts,
the WT memorizing unit having stored therein the proportional portion repeated amount W and the step number T, the step number T being equal to the tax amount of a taxable amount equal to W,
the first register having stored therein a taxable amount α,
the second register having stored therein the maximum taxable amount A of the unproportional portion,
the calculating unit being connected to the first and second registers, to the tax amount data memorizing unit and the WT memorizing unit to perform the calculation $\alpha - A = C$, to calculate N by determining the number of times W can be subtracted from C, to perform the calculation $NT = E$, to perform the calculation $\alpha - WN = F$ and to retrieve from the tax amount data memorizing unit the tax amount G for the taxable amount F, and to determine the tax amount K for the taxable amount α by performing the calculation $E + G = K$.

3,963,911

HYBRID SAMPLE DATA FILTER

Lewis E. Franks, Amherst, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 22, 1975, Ser. No. 570,975
Int. Cl.² H03H 7/10; H03K 13/22; G06F 7/38
U.S. Cl. 235—156 **2 Claims**



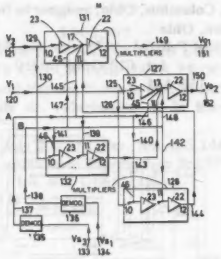
1. A nonrecursive sample data filter comprising:
a. a delta modulator;
b. a shift register fed by the delta modulator having a series of selected output taps;
c. a clock pulsing the delta modulator and the shift register;
d. means for scaling the series of outputs of the shift register, the scaling means including
1. a reference voltage source,
2. a counter pulsed by the clock and having a series of complementary pairs of outputs,
3. a plurality of coefficient multipliers each fed by the plurality of complementary pairs of outputs of the counter and each including
a. a plurality of coefficient setting switches each having an output terminal and a pair of selected input terminals, each of the pairs of input terminals connecting one of the complementary output pairs of the counter,
b. a NAND gate fed by the output terminals of the plurality of coefficient setting switches,
c. a flip-flop fed by one of the selected output taps of the shift register, triggered by the clock, and having a clearing terminal connected to the output of the NAND gate,
d. a programmable switch having an input terminal connected to the reference voltage source and an output terminal, the programmable switch being activated by the output of the flip-flop; and
e. a coefficient sign switch having an input terminal and a pair of selectable output terminals with the input terminal connected to the output terminal of the progammable switch,
4. means for summing the outputs of the coefficient multipliers, the summing means being connected to the coefficient sign switches; and
e. a demodulator connector to the output of the summing means.

3,963,912

SIGNAL RESOLVING APPARATUS

Kenneth Robson Brown, Kirknewton, and Colin Keith Sharp, Edinburgh, both of Scotland, assignors to Ferranti, Limited, Lancashire, England

Filed Sept. 19, 1974, Ser. No. 507,422
Claims priority, application United Kingdom, Sept. 22, 1973, 44550/73
Int. Cl.² G06G 7/22
U.S. Cl. 235—189 **4 Claims**



1. Signal resolving apparatus comprising first input terminals for applying coordinate input signals in a first set of axes, second input terminals for applying further input signals which, when combined with one another in predetermined ways, give trigonometric functions required to translate between the first set of axes and a second set of axes, output terminals for supplying output signals in said second set of axes, and multiplier circuits, one for each coordinate of each signal to be resolved, connected to respond to the appropriate coordinate signal and to combinations of the further input signals representing particular trigonometric functions to produce outputs representing the product of the inputs, and means for additively combining the outputs to give the desired output signals in the second axes.

3,963,913

WALL MOUNTED DISPLAY SYSTEM

Robert W. Donovan, Ridgefield, Conn.; Harvey L. Kolster, Grain Valley, Mo.; Herbert H. Broeker, and George W. Bailey, both of Overland Park, Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Division of Ser. No. 414,640, Nov. 12, 1973, Pat. No. 3,865,248. This application Nov. 7, 1974, Ser. No. 521,837
Int. Cl.² F21V 33/00
U.S. Cl. 240—2 AD **9 Claims**

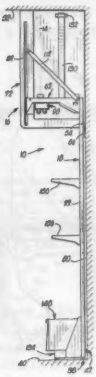
1. In article display apparatus for an area having an upright wall surface extending upwardly from the floor thereof to an overhead ceiling, the improved combination comprising:
a pair of upright standards adapted to be located adjacent the wall surface in disposition to be supported by the floor;

at least one tie element adapted to be mounted on the wall surface intermediate the ends of the standards;

means for coupling the standards to the tie element for preventing swinging movement of the standards away from the wall surface;

means mounted on the standards for receiving articles to be displayed;

a soffit and valance assembly carried by the standards above the article receiving means and including support structure extending forwardly from each standard, upright



valance means mounted on the support structure and extending upwardly therefrom toward said ceiling, and soffit defining means carried by the support structures in disposition extending rearwardly from the valance means to a location proximal to the standards; and

illuminating means carried by the support structures above the soffit defining means and behind the valance means, said soffit defining means being light pervious to permit light from the illuminating means to be directed downwardly therefrom onto articles carried by said article receiving means.

3,963,914

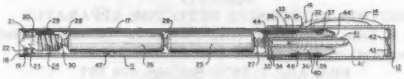
COMBINATION WRITING IMPLEMENT AND FLASHLIGHT

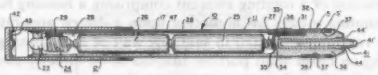
Scott M. Browning, 3269 Polk Ave., Ogden, Utah 84403, and Gregory F. Klomp, 2500 Fillmore, Ogden, Utah 84401

Filed Apr. 9, 1975, Ser. No. 566,371

Int. Cl.² F21L *1/00*; **B43K** *29/10*

U.S. Cl. 240—6.46 **7 Claims**





1. A self-illuminating writing device including, in combination, a writing implement having a reverse end and a forwardly oriented writing tip, said reverse end being provided with light means, and a cap selectively positioned over said writing tip and also removable therefrom for selective positionment over said reverse end having said light means, said light means facing away from said tip for emitting observable light energy in a direction reverse to the forward orientation of said tip when said cap is removed from said reverse end, said implement including translucent structure transmitting said light energy proximate said tip, said cap including an internal reflector means, facing said light means when said cap is disposed on said reverse end of said writing implement, for reflecting light energy through said implement to said tip when said cap is so disposed on said reverse end of said implement, said implement including an internal battery and switching means for selectively coupling said battery to said light means.

3,963,915

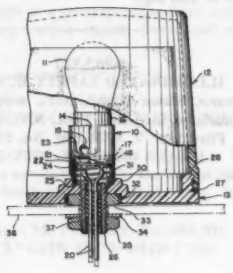
WATERTIGHT LIGHT ASSEMBLY

Jack B. Spivey, 300 Casper St., Edmonds, Wash. 98020

Filed Feb. 15, 1974, Ser. No. 443,087

Int. Cl.² B63B *45/04*

U.S. Cl. 240—7.1 R **4 Claims**



1. A light socket assembly, comprising:

a socket member having an annular spring seat opposite the mouth of the socket and having a hollow stud extending from the set, said socket having bayonet slots for receiving prongs on a light bulb,

watertight conductor lead means passing axially through the stud to a terminal end in the socket,

an elastomeric watertight diaphragm plug in the stud bonded to the stud and to the lead means, said bonding between the plug and stud preventing the plug from sliding along the stud and said bonding between the plug and lead means transmitting axial forces from the lead means to the plug to axially deform the plug when an axial force is exerted on the lead means,

a thrust member in the socket fastened to the terminal end of the lead means and adapted to contact a conducting portion of a light bulb in the socket, and

compression spring means extending between the seat and thrust member urging the thrust member away from the stud, thereby placing an axial force on the lead means and axially deforming the diaphragm plug when a light bulb is not in the socket.

3,963,916

BULBHOLDER

Kenneth Leonard Morton, Market Harborough, England, assignor to British Sealed Beams Limited, Corby, England

Filed Nov. 20, 1974, Ser. No. 525,454

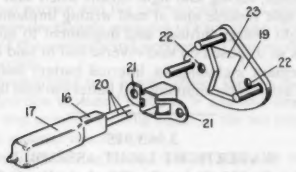
Claims priority, application United Kingdom, Jan. 16, 1974, 2074/74

Int. Cl.² F21V *21/00*

U.S. Cl. 240—52 R **6 Claims**

1. A bulbholder comprising a body adapted to receive a base of a bulb, at least one flange for mounting said body on a support, and a plurality of deformable legs connecting said flange with said body, said legs serving to support said body on

said flange and being deformable to enable said body to be adjusted in more than one direction relative to said flange for



bulb filament orientation purposes, and said legs holding said body in the required position relative to said flange after deformation of said legs.

3,963,917

ILLUMINATED SAFETY HELMET

James Romano, Staten Island, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 7, 1975, Ser. No. 556,107
Int. Cl.² A42B 1/24; F21V 7/02
U.S. Cl. 240—60 4 Claims

1. An illuminated safety helmet comprising:

a. a hard, tough convex shell adapted for serving as a protective cover for the head of the wearer, which shell possesses a transparent bubble-like protrusion at its apex, which protrusion is adapted for visibility from any unobstructed lateral aspect;

b. an adjustable harness affixed to the inner periphery of the helmet to keep the head of the wearer from contacting the inner surface of the shell;

c. an incandescent bulb rotatably mounted in the transparent protrusion, upon which incandescent bulb is fixed a vertically oriented mirror-like partition visually separating the bulb into differently colored halves, said bulb adapted to be coupled to a source of energy;

d. driving means for rotating the bulb, adapted to be coupled to said source of energy;

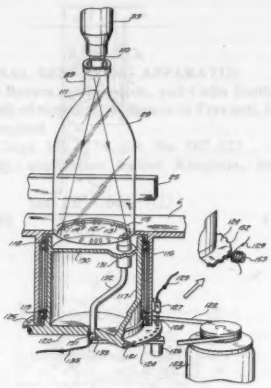
e. a switch electrically connected to be capable of interrupting the source of energy and mounted on the shell and conveniently reachable by the wearer.

3,963,918

IDENTIFICATION DEVICE FOR MACHINE MOULDED PRODUCTS

Claes-Goran Jensen, Malmo, and Lars Olof Hansson, Oxie, both of Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden

Filed June 17, 1974, Ser. No. 479,647
Claims priority, application Sweden, June 21, 1973, 7308779
Int. Cl.² G01D 21/04
U.S. Cl. 250—223 B 5 Claims



1. Apparatus for identifying which of a plurality of moulds moulded a particular light transparent container comprising containers formed by the moulds, each container having integrally moulded in a line along its bottom a coded combination of lens members for focussing light projected onto the inner surface of the bottom of the container to a focal plane opposite the outer surface of the bottom of the container, each of said coded combinations being associated with a different mould; light source means for projecting light onto said inner surface of the bottom of the container; light detector means including a short focus objective lens focused at said focal plane, a photo-sensitive transducer for generating signals whose amplitude is a function of received light, guiding means for guiding light from said short focus objective lens to said photo-sensitive transducer and means for emitting a pulse each time the generated signal exceeds a given amplitude; and moving means for causing a relative movement along said line between said lens members and said short focus objective lens.

3,963,919

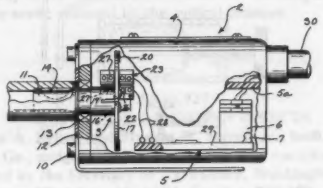
MOTION RESPONSIVE DETECTOR APPARATUS

Fred E. Sells, Milwaukee, Wis., assignor to National Controls Corporation, Addison, Ill.

Filed Aug. 7, 1974, Ser. No. 495,507
Int. Cl.² G01D 5/34
U.S. Cl. 250—231 SE 16 Claims

15. A motion monitoring means for selectively determining the motion of a rotating element comprising a housing having a mounting means for mounting upon a driven apparatus, a shaft rotatably mounted in said one wall of said housing and having an outer shaft portion adapted to be directly coupled to the monitored motion of the rotating elements, a coding disc formed of the light transmitting plastic, means firmly mounting said disc on the inner end of said shaft, the outer periphery of said disc being formed with alternate opaque and light transmitting equicircumferentially spaced radial sections, a pair of photodetector assemblies mounted in circumferentially spaced relation within said housing and each including

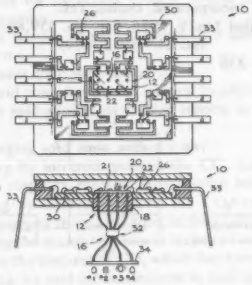
a pair of oppositely projecting arms defining a slot through which the radial sections of the encoding disc rotate, a light emitting diode being mounted in one of said arms and a phototransistor being mounted in the opposite of said arms in alignment with the output of the light emitting diode whereby the conductivity of the phototransistor is alternately increased and decreased in accordance with the rotation of the encoding discs, a solid state signal processing circuit mounted within said housing and including a pair of signal processing channels, each of said channels including a dual input Schmitt trigger circuit having an inverting input and a non-inverting input, a retriggerable monostable multivibrator having an input connected to the output of said trigger circuit and having a positive output and a not-output, each of said monostable multivibrators having an adjustable presettable timing means to determine the width of the output pulse of the monostable multivibrator having an inhibit input to prevent retriggering of the monostable multivibrator and thereby establishing a single output pulse in response to an input pulse, and circuit means interconnected of the said channels to each other and to the encoding means to selectively provide an output responsive to the motion detected, a signal integrating circuit having a signal integrating capacitor connected to the output of at least one of said monostable multivibrators to integrate the variable width pulse signals, a transistor connected in said integrating circuit and particularly across said integrating capacitor and responsive to a selected voltage on the capacitor to conduct and provide an output related to the total summed variable width pulse signals.



3,963,920
INTEGRATED OPTICAL-TO-ELECTRICAL SIGNAL TRANSDUCING SYSTEM AND APPARATUS

John P. Palmer, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Mar. 10, 1975, Ser. No. 556,612
Int. Cl.² H01J *39/12*; G02B *5/16*
U.S. Cl. 250—239 **18 Claims**



1. Integrated optical-to-electrical signal transducing apparatus comprising, in combination:

a container including a first wall;

an optical fiber terminating plug supporting a plurality of spaced first ends of optical fibers and carried in said first wall, said plug having a terminating surface ground optically smooth and polished in a plane normal to the longitudinal axis of the fibers and including the first ends of the fibers in said surface;

an array of photo-sensitive elements supported in said container with said elements opposing respective ones of said spaced ends of said optical fibers, said array comprising a single detector substrate having a first planar surface aligned with and in contact with said plug terminating surface and a thin semiconductor layer vacuum deposited over an area of the detector substrate encompassing the ends of the fibers, selected regions of said layer in respective registration with corresponding ones of said fiber ends being sensitized to form said photo-sensitive elements as light-sensitive barriers to current flow through said regions;

preamplifier means carried in said container and coupled to respective ones of said photo-sensitive elements for responding to current through a selected barrier region in response to light at a corresponding fiber end; and

means for taking output signals from said preamplifier means.

3,963,921
METHOD FOR PRODUCING URANIUM ATOMIC BEAM SOURCE

Oscar H. Krikorian, Danville, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

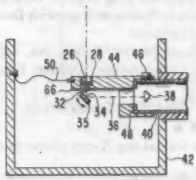
Filed Apr. 16, 1974, Ser. No. 462,016
Int. Cl.² G01N *27/78*; B01D *57/00*
U.S. Cl. 250—251 **7 Claims**

1. A method for producing a beam of neutral uranium atoms comprising the step of vaporizing uranium from a uranium-bearing compound composed essentially of uranium and a metal M whose vapor pressure is negligible compared to the vapor pressure of uranium at vaporization temperature and selected from the group consisting of rhenium, osmium, iridium, and niobium.

3,963,922
X-RAY FLUORESCENCE DEVICE

Hans R. Zulliger, and Lee M. Middleman, both of Portola Valley, Calif., assignors to Nuclear Semiconductor, Menlo Park, Calif.

Filed June 9, 1975, Ser. No. 584,937
Int. Cl.² G21K *7/00*, *1/00*; G01N *23/00*, *23/20*
U.S. Cl. 250—272 **10 Claims**



1. Apparatus for adapting an electron column instrument for X-ray fluorescence analysis of a sample, the electron column instrument being of the type having means for generating an electron beam and a surrounding evacuated chamber, the adapting apparatus comprising:

a target foil positioned to be struck on one side by the electron beam to thereby produce a fluorescent, primary X-ray beam directed to impinge upon the sample,

energy dispersive X-ray spectrometer means for detecting X-rays fluoresced from the sample by the primary X-ray beam, and wherein

the target foil, sample, and detecting means are contained within the evacuated chamber.

3,963,923
ION MICROPROBES

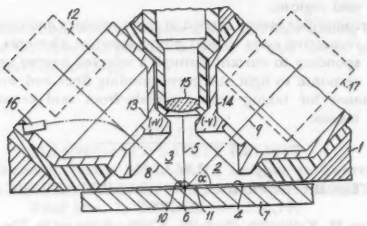
John Neil Coles, Trumpington, and James Victor Percival Long, Haslingfield, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 1, 1975, Ser. No. 564,084

Claims priority, application United Kingdom, Apr. 2, 1974, 14532/74

Int. Cl.² H01J 37/26

U.S. Cl. 250—309 **6 Claims**



1. An ion microprobe including an ion extraction arrangement comprising two separate paths for ions and electrons diverging from a common point, a generally cone-shaped guard electrode surrounding each path, the apex angles of which guard electrodes are equal to each other and the apexes coinciding with the said point, said guard electrodes being positioned to lie tangentially to each other and to a planar surface including the said point, an aperture for said paths at the common apex of both guard electrodes, electrical connection between the guard electrodes for enabling the same potential to be applied to both guard electrodes, means for generating electric fields within the guard electrodes oppositely polarised with respect to each other, and means for allowing a focussed ionising beam to strike the said point without suffering astigmatism.

3,963,924
METHOD AND APPARATUS FOR TAKING X-RAY PICTURES

John Wilson Boag, Sutton; Paul Nelson Jeffery, Chandler's Ford, both of England, and Harold Elford Johns, Toronto, Canada, assignors to National Research Development Corporation, London, England

Filed June 26, 1974, Ser. No. 483,432

Claims priority, application United Kingdom, June 23, 1973, 30682/73

Int. Cl.² G03B 41/16

U.S. Cl. 250—315 A **7 Claims**

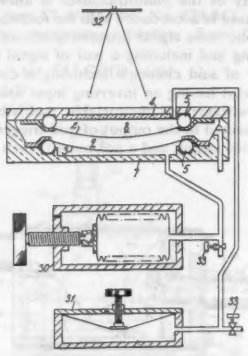
1. An apparatus for taking X-ray pictures of an object comprising:

a source of ionizing radiation,

a housing,

a pair of electrodes in said housing defining an ionization chamber, at least one of said electrodes being in the form of a flexible sheet which includes a conductive layer and an insulating layer for collecting on the surface thereof ions generated in said chamber, both of said electrodes having substantially spherically curved surfaces with their respective centers of curvature being located at said source of ionizing radiation,

means for establishing a differential gas pressure across said at least one flexible sheet for forming said at least one flexible sheet into a spherically curved shape having a center of curvature at said source of ionizing radiation,



means for applying a potential difference across said electrodes, and

means for introducing into said ionization chamber an ionizing radiation absorbing gas.

3,963,925
PHOTOCONDUCTIVE DETECTOR AND METHOD OF FABRICATION

Billy H. Breazeale, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 26, 1975, Ser. No. 553,346

Int. Cl.² G01J 1/00

U.S. Cl. 250—338 **8 Claims**

1. An improved infrared detector comprising:

a. a slab of photoconductive material;

b. a pair of spaced electrodes mounted adjacent opposing sides of said slab, said spaced electrodes forming an interelectrode dimension across the slab;

c. a layer of anti-reflecting and insulating material covering the slab between the spaced electrodes; and

d. means for forming a detector element active region between the electrodes selectively on the interelectrode dimension of the slab.

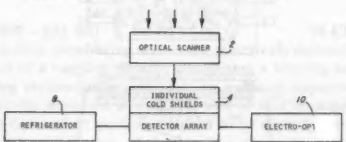
3,963,926
DETECTOR COLD SHIELD

Sebastian R. Borrello, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 9, 1975, Ser. No. 539,893

Int. Cl.² H01J 31/49

U.S. Cl. 250—338 **8 Claims**



1. A thermal energy receiver comprising:

a. an optical scanner for scanning a scene emanating thermal energy, said optical scanner producing a field of view of the scene;

b. an array of thermal energy semiconductor detectors mounted in the path of the field of view of the optical scanner for porducing electrical signals representative of the thermal energy impinging thereon;

c. an array of thermal energy absorbing semiconductor elements mounted on the substrate of the array of semiconductor detectors with edges in preselected juxtaposition to the field of view path for absorbing any interfering thermal energy generated outside the field of view of the optical scanner to improve the signal to noise ratio of the semiconductor detector array;

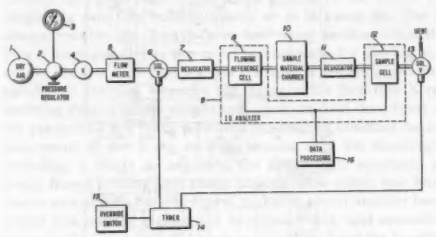
d. cooling means for cooling the array of detectors and array of thermal energy absorbing semiconductor elements; and

e. electro-optics coupled to the electrical output of the array of semiconductor detectors for forming a display of the scene scanned by the optical scanner.

3,963,927
DETECTION OF HIDDEN INSECTS

William A. Bruce, and Marion W. Street, Jr., both of Savannah, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 18, 1975, Ser. No. 588,108
Int. Cl.² G01N *21/34*
U.S. Cl. 250—338 **10 Claims**



1. A method for detecting hidden insects in agricultural material comprising:

a. placing a sample of said material in a substantially enclosed zone;

b. purging said zone with dry air;

c. sealing said zone for a time interval to allow the buildup of CO_2 in said zone from hidden insects in said material therein;

d. again purging said zone with dry air;

e. measuring by infrared analysis the CO_2 content of said dry air in step (d), prior to introduction into said zone;

f. measuring by infrared analysis the CO_2 content of gas which is purged from said zone in step (d);

g. comparing the measurements in steps (e) and (f) so as to determine the amount of CO_2 which has been imparted to said dry air by said hidden insects in said zone;

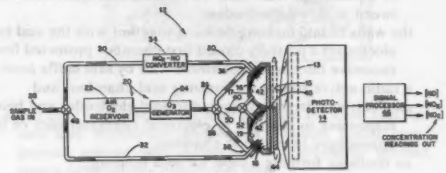
h. sealing said zone for the same time interval as in step (c) to again allow the buildup of CO_2 in said zone from said hidden insects; and

i. thereafter repeating steps (d), (e), (f), and (g).

3,963,928
MULTIPLE CHAMBER CHEMILUMINESCENT ANALYZER

William J. Zolner, Westford, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation of Ser. No. 470,876, May 17, 1974, Pat. No. 3,882,028. This application Mar. 17, 1975, Ser. No. 558,749
The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.² G01T *1/20*
U.S. Cl. 250—361 C **20 Claims**



1. Apparatus for observing chemiluminescent reaction comprising:

a plurality of reaction chambers having optical openings therein;

means for supplying reagents and samples to each of said reaction chambers;

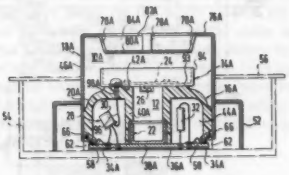
a photodetector spatially arranged to observe sites of reaction in each of said chambers for detecting radiant energy given off as a result of chemiluminescent reaction in said chambers and for generating an output responsive to said detected energy; and

means periodically coupling and uncoupling radiant energy from each of said chambers to said photodetector for forming in said output a sequence of discrete time-wise interlaced signals.

3,963,929
IONIZATION ANALYZING AIR POLLUTION, SMOKE AND FIRE ALARM DEVICE

Hartwig Beyersdorf, Bad Oldesloe, Germany, assignor to GEBA-Gesellschaft fur elektronische Brandmeldeanlagen mbH & Co., Hamburg, Germany

Division of Ser. No. 460,041, April 11, 1974. This application Mar. 10, 1975, Ser. No. 556,931
Claims priority, application Germany, Apr. 24, 1973, 2320604; Jan. 24, 1975, 2403418
Int. Cl.² G08B *21/00*
U.S. Cl. 250—384 **19 Claims**



1. An ionization analyzing air pollution and fire alarm signal device comprising:

a housing including an outer wall and a peripheral cover with a central opening permitting passage of ambient air therethrough;

at least two electrodes;

a first electrode, having a substantially planar portion mounted in said housing adjacent said cover of a size and surface shape conforming to those of said opening in said cover; and

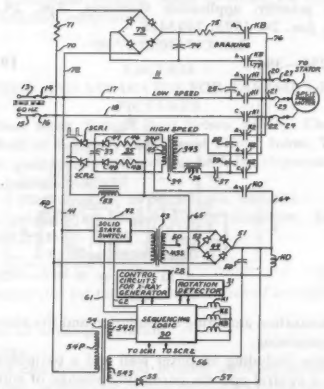
a second electrode located within said housing;
one end of said outer wall of said housing projecting axially beyond said first electrode and forming a sealing support for the outer edge of said cover;
spacers with apertures between them connecting said housing with said first electrode;
said cover defining together with said first electrode a baffle zone;
said cover, the planar portion of said first electrode and said second electrode mounted in planes parallel to each other and spaced from each other distances permitting passage of ambient air from said baffle zone and from there between said two electrodes;
the walls of said housing defining together with the said two electrodes a partially closed first chamber protected from excessive fluctuations of ambient air by said baffle zone;
a radio-active source for ionizing said chamber, and
an electrical circuit connected to said electrodes and being responsive to changes in electrical characteristics of the atmosphere in said first chamber,
an insulator forming a base for said housing,
said second electrode mounted on said insulator;
said outer wall of said housing being tubular;
at least a portion of the outer wall of said insulator being tubular and of a diameter mating with the tubular shape of said housing and permitting slipping on of said housing over the insulator;
said insulator having an outside wall of cuplike shape, open on its rear which faces away from the said second electrode, and an inside wall spaced from the said outside wall, and connected thereto in the area of the bearing surface of the second electrode, and
a signal transmitter circuit responsive to changes in electrical characteristics of the atmosphere in said first chamber in circuit connection with said electrodes, and having its circuit elements arranged within the insulator.

3,963,930

SYSTEM FOR CONTROLLING OPERATION OF THE ROTATING ANODE OF AN X-RAY TUBE

Louis L. Fiocca, Bensenville; Joel J. Schmutzer, Oak Park, and John I. Klusendorf, Schaumberg, all of Ill., assignors to Advanced Instrument Development, Inc., Melrose Park, Ill.

Filed Dec. 5, 1974, Ser. No. 529,735
Int. Cl.² H05G *1/70*
U.S. Cl. 250—402 **7 Claims**



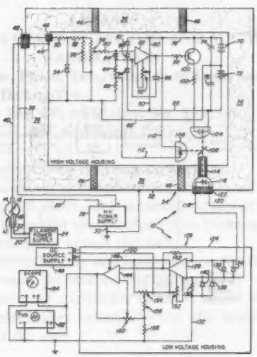
1. In an X-ray system, said system having an X-ray tube with a rotatable anode and an alternating current induction motor having a stator and a rotor for rotating said anode, said X-ray tube having an X-ray generator, control circuits for said generator, said system being connectable to a source of alternating current power at line frequency, the improvement comprising, closed loop control circuitry means for said X-ray system, including the X-ray generator control circuits, vibration responsive means for sensing the actual rotating speed of the anode and providing an output responsive thereto, and motor control means selectively operable to connect said source of power to said stator in response to the output from said sensing means, and means inter-connecting the X-ray generator control circuits, the sensing means, and the motor control means to provide said closed loop control circuitry means for regulating the rotor rotation at a selected speed, for enabling operation of said X-ray generator at least at said selected speed and for braking said rotor rotation.

3,963,931

X-RAY TUBE CURRENT MONITOR

Jonathan Salem Shapiro, Greenwich, Conn., assignor to The Machlett Laboratories, Incorporated, Stamford, Conn.

Filed Apr. 10, 1975, Ser. No. 566,890
Int. Cl.² G01R *31/00*; G02B *27/00*; H05G *1/30*
U.S. Cl. 250—416 R **10 Claims**



1. An X-ray tube monitoring apparatus comprising:
current sensing means disposed for electrical connection between an electrode of an X-ray tube and a direct current source for producing an electrical output signal indicative of a unidirectional current flowing through the tube;
opto-electronic isolating means coupled to the current sensing means for transmitting the signal therefrom in an electrically insulating manner to a respective output terminal of the isolating means; and
instantaneous display means electrically connected to the output terminals of the opto-electronic isolating means for indicating instantaneous changes in the value of a current flowing through the X-ray tube.

3,963,932

X-RAY TOMOGRAPHY APPARATUS

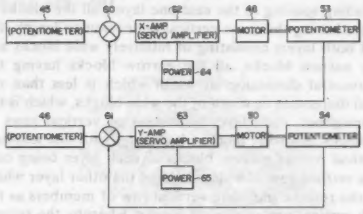
Hidemaru Ohno, Tokyo, and Yutaka Hayashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 17, 1974, Ser. No. 489,406

Claims priority, application Japan, July 20, 1973, 48-81354; Aug. 31, 1973, 48-102311[U]

Int. Cl.² G03B 41/16

U.S. Cl. 250—445 T **2 Claims**



1. An X-ray tomography apparatus comprising a bed on which an object is laid; X-ray emitting means for irradiating X-rays onto the cross section of an object; an iris diaphragm having a diaphragm aperture through which the X-rays pass; means for holding an X-ray film for receiving the X-rays penetrating through the cross section of the object to form an X-ray image thereon; and operating means for moving said X-ray emitting means in a given orbit so as to cause the central axis of the X-rays therefrom to always pass through a prescribed reference point of the cross section of the object, for displacing said film holding means so as to cause the film to always receive the X-rays from said cross section while the film is kept parallel to the cross section, and for driving said iris diaphragm such that the iris aperture is always positioned parallel to the film whereby the X-ray paths from the X-ray emitting means to the diaphragm aperture and therefrom to the prescribed reference point are maintained constant during movement of the X-ray emitting means, said iris diaphragm including a blade to regulate the diaphragm aperture, an inside frame holding said blade and rockable about one horizontal axis and an outside frame rockable about another horizontal axis normal to said one horizontal axis, said operating means including a link mechanism rockable about the longitudinal and lateral axes of the bed, said link mechanism having a first link mounting said X-ray emitting means and iris diaphragm on an extended end portion and a second link mounting the film holding means on an extended end portion, said two links always being kept parallel to each other, means for swinging said iris diaphragm to rock said iris diaphragm to thereby hold the diaphragm aperture always parallel to the X-ray film during the movement of the diaphragm, said swinging means including a first motor for rocking the outside frame and a second motor for swinging the inside frame, and a first detector for detecting a swung angle of the link mechanism in one direction, a second detector for detecting a swung angle in the other direction, and an electric circuit for driving said first and second motors in response to output signals from these detectors.

3,963,933

MAMMOGRAPHY FIXTURE

John L. Henkes, Jr., Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,418

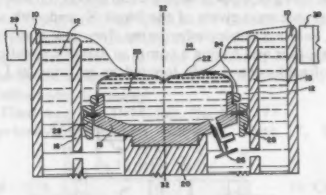
Int. Cl.² G03B 41/16

U.S. Cl. 250—456 **11 Claims**

1. A fixture for compressing a pendant breast during tomographic mammography procedures comprising:

a substantially circular pan having an upwardly directed concave surface;

a thin, elastic membrane disposed over said concave surface and sealably affixed to the circumference of said pan; and



a first fluid transmission medium disposed between said pan and said membrane whereby a pendant breast compressed against said membrane is conformally pressed into a substantially cylindrical form.

3,963,934

TRITIUM TARGET FOR NEUTRON SOURCE

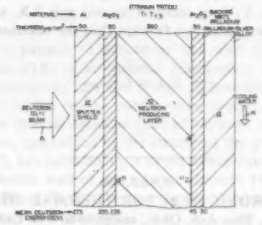
John H. Ormrod, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 340,336, March 12, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,515

Claims priority, application Canada, May 16, 1972, 142273

Int. Cl.² G21G 4/02

U.S. Cl. 250—499 **5 Claims**



1. A tritium target for use in conjunction with a beam of deuterons to provide a neutron source that comprises a target layer of tritiated titanium sandwiched between first and second layers of a metal oxide which act to inhibit diffusion of tritium out of the target layer and diffusion back into the target of deuterons that have passed therethrough, the said first metal oxide layer being on the beam side of the target layer, a layer of aluminum on the first metal oxide layer to protect the metal oxide layer from sputtering action by direct impingement of the deuteron beam, a metallic backing layer on the second metal oxide layer, said backing layer being of a metal having a high diffusion coefficent, and cooling means adjacent the backing layer for cooling the said target and absorbing and diffusing stopped deuterons.

3,963,935

SHUTTER DESIGNED TO BLOCK HIGH-ENERGY PARTICLE BEAMS

Bernard Donnadille, Paris, France, assignor to C.G.R.-Mev., Paris, France

Filed Apr. 4, 1975, Ser. No. 565,137

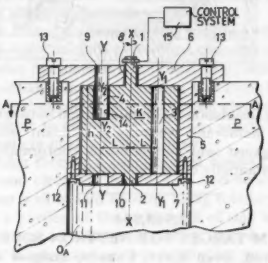
Claims priority, application France, Apr. 9, 1974, 74.12472

Int. Cl.² G21F 5/04; G21K 1/02

U.S. Cl. 250—514 **5 Claims**

1. A shutter for a high-energy particle beam, which makes it possible to close off an opening formed in a wall of a given

thickness, comprising a metal block K of cylindrical form having a radius R and an axis XX, said block K being equipped at each of its ends and on the axis XX, with pivots, said block K being arranged in a cylindrical metal cage closed at its ends respectively by a first plate and by a second plate, each of said plates being equipped with a central hole in which there can engage one said pivots of the block K, and with an eccentric hole, said eccentric holes being disposed mutually opposite one another and having a common axis YY parallel to the axis XX of said central hole located at an interval L therefrom,



said cylindrical block K being provided with longitudinal passage of cylindrical form, having a diameter d and axis Y_1Y_1 parallel to said axis XX and located at an interval L from the latter, and also containing a blind hole, referred to as a "pit,"-'having a diameter substantially equal to said diameter d and having an axis Y_2Y_2 parallel to said axis XX and symmetrical with said axis Y_1Y_1 in relation to said axis XX, said distance L being chosen in such a fashion that the relationship:

$$\frac{d}{2} < L < L - \frac{d}{2}$$

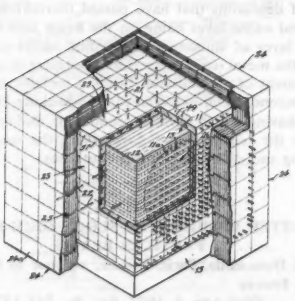
is satisfied.

3,963,936

NEUTRONIC REACTOR THERMAL SHIELD

Paul E. Lowe, Blue Ash, Ohio, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 14, 1955, Ser. No. 494,298
Int. Cl.² G21F 3/04
U.S. Cl. 250—517 1 Claim



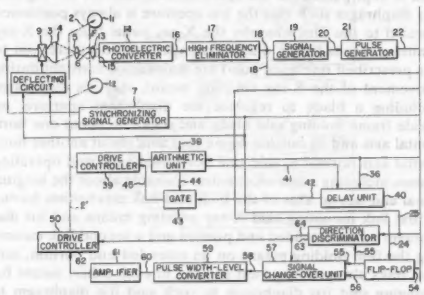
1. The combination with a plurality of parallel horizontal members arranged in horizontal and vertical rows, the spacing of the members in all horizontal rows being equal throughout, the spacing of the members in all vertical rows being equal throughout; of a shield for a nuclear reactor comprising two layers of rectangular blocks through which the members pass generally perpendicularly to the layers, each block in each layer having for one of the members an opening equally spaced from vertical sides of the block and located closer to the top of the block than the bottom thereof, whereby gravity tends to make each block rotate about the associated member to a position in which the vertical sides of the block are truly vertical, the openings in all the blocks of one layer having one equal spacing from the tops of the blocks, the openings in all the blocks of the other layer having one equal spacing from the tops of the blocks, which spacing is different from the corresponding spacing in the said one layer, all the blocks of both layers having the same vertical dimension or length, the blocks of both layers consisting of relatively wide blocks and relatively narrow blocks, all the narrow blocks having the same horizontal dimension or width which is less than the horizontal dimension or width of the wide blocks, which is the same throughout, each layer consisting of vertical rows of narrow blocks and wide blocks alternating with one another, each vertical row of narrow blocks of each layer being covered by a vertical row of wide blocks of the other layer which wide blocks receive the same vertical row of members as the said each vertical row of narrow blocks, whereby the rectangular perimeters of each block of each layer is completely out of register with that of each block in the other layer.

3,963,937

INFORMATION SEARCHING DEVICE

Mutsuhiro Inoue, Sagamihara; Akira Konno, Tokyo, and Yukio Izaka, Inagi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,394
Claims priority, application Japan, Aug. 29, 1973, 48-97087
Int. Cl.² G01N 21/30
U.S. Cl. 250—548 30 Claims



1. An arrangement for searching a desired frame, or frames, of an image on a film having marks associated with the frames comprising:

means for feeding the film;

means for repeatedly scanning, at a constant repetition rate, a scanned area which the film runs through, to detect the mark, said scanning means being adapted to scan the mark a plurality of times to produce, in each scanning, a detection signal when detecting the mark, so that a plurality of the detection signals associated with the mark are produced while the scanned area contains the mark;

means operative in response to the detection signals for making, from the plurality of detection signals, a mark signal which is for use in identifying the marks that have passed through the scanned area; and

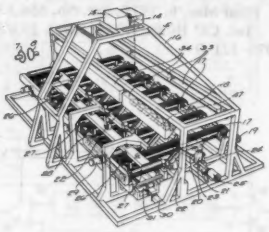
means operative in response to the mark signals for controlling the feeding of the film when receiving the mark signal associated with a desired frame, or frames, of an image on the film.

3,963,938

APPARATUS FOR SCANNING CANTS TO DETERMINE OPTIMUM EDGING CUTS

Benkt Sanglert, Jonkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Apr. 16, 1975, Ser. No. 568,608
Claims priority, application Sweden, Apr. 22, 1974, 7405346
The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Int. Cl.² G01N 21/30
U.S. Cl. 250—561 8 Claims



1. Apparatus for scanning an unfinished elongated workpiece having a substantially flat top surface that terminates at a pair of opposite, longitudinally extending side edges and having a pair of generally downwardly extending side surfaces that extend along its length and meet said top surface at the respective side edges, said apparatus producing signals as a result of such scanning that are related to the orientation and configuration of said side edges and their spacing from one another, said apparatus comprising:

A. workpiece supporting means defining an elongated scanning station which extends lengthwise in one horizontal direction and at which a workpiece can be held stationary with its top surface horizontal;

B. a reflector having a flat reflecting surface;

C. means mounting the reflector for flatwise swinging motion about a fixed horizontal axis which is parallel to said reflecting surface, said axis also being

1. transverse to said one direction and

2. so spaced above the supporting means that the reflector can reflect to a location above the supporting means an image of a zone which extends entirely across a workpiece on the supporting means and which moves lengthwise along the scanning station as the reflector swings about said axis;

D. photoresponsive detector means fixed at said location to receive the image reflected by the reflector and arranged for repetitive electronic scanning at a predetermined rate along a line parallel to said axis;

E. lens means located in an optical path between said reflector and said detector means and arranged to bring into focus at said detector means said image reflected in said reflecting means;

F. actuating means for swinging the reflector about said axis towards and from a defined starting position and through at least one scanning traverse which starts with the reflector in said starting position, said actuating means maintaining a rate of swing of the reflector during said scanning traverse that is so related to the rate of repetitive scanning as to advance the imaged zone lengthwise along the scanning station from scan to scan; and

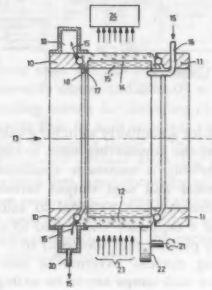
G. lighting means comprising a plurality of light sources located at a level above the supporting means to cast illumination along the full length of the scanning station and to so illuminate a workpiece on the supporting means as to delineate each of said side edges thereon by illuminating only one of the two surfaces which meet at said side edge.

3,963,939

ANALYZING GASES BY TESTING THE OPTICAL CHARACTERISTICS OF EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Josef Zweng, Warmbronn, and Iwan Komaroff, Regensburg, both of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Aug. 27, 1975, Ser. No. 608,277
Claims priority, application Germany, Sept. 7, 1974, 2442968
Int. Cl.² G01N 21/26
U.S. Cl. 250—576 16 Claims



1. In an apparatus to determine the soot content in the exhaust gases (13) of an internal combustion engine, a gas optical transmissivity analysis system connected into the exhaust stream of the engine, said system comprising

a rotatable tubular element (12) of material transparent to radiation, connected in the stream of the gas (13);

means (15, 16) introducing a liquid transparent to radiation to the inside wall of the tubular element (12) to form a film (15) of liquid thereon by centrifugal force upon rotation of said element;

means (23) directing radiation across said tubular element (12) through the liquid film (15) centrifugally adhering to the inner wall of the tubular element (12) and through the gas stream flowing therein;

and means (24) analyzing the radiation received after having passed through said stream to provide a measure representative of the optical characteristics of the gas flowing through the tubular element (12) and hence of the soot content of the exhaust gas.

3,963,940

AUTOMATIC HEADLIGHT CONTROL CIRCUIT

Michael R. Adamian, P.O. Box 223, Naperville, Ill. 60540

Filed Feb. 4, 1975, Ser. No. 547,002
Int. Cl.² B60Q 1/08
U.S. Cl. 307—10 LS 6 Claims

1. Automatic control apparatus for use in an automotive vehicle having one or more lamps, an electrical power source, and a source of engine ignition pulses, said control apparatus comprising:

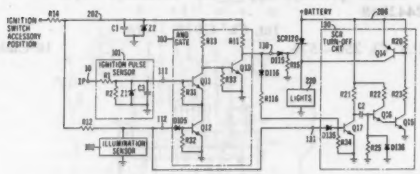
circuit means connected to said source of ignition pulses for generating a first series of output signals corresponding to said ignition pulses at least in duration;

light sensitive means responsive to changes in ambient illumination for indicating level of ambient illumination;

gate circuit means responsive to said light sensitive means and said first series of signals for generating a second series of output signals corresponding to said ignition

pulses, at least in duration, when ambient illumination is below a selected level;

a gate controlled bi-stable semi-conductor device having a control terminal, a current input terminal, and a current output terminal, and connected at its current input and output terminals in series in a current path from said power source to said lamps and responsive to one of said second series of signals from said gate circuit means corresponding to said ignition pulses at least in duration, applied to said control terminal, to switch from a non-conducting state to a conducting state; and



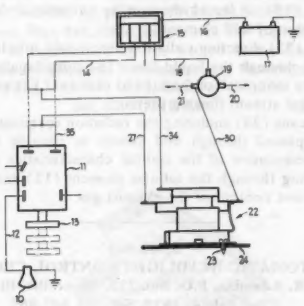
circuit means for selectively switching said semi-conductor device from the conducting state to the non-conducting state comprising a transistor connected between said input terminal and said output terminal for shunting current there-between external to said semi-conductor device, and a capacitor connected to said transistor for temporarily placing said transistor in a conducting mode for shunting current external to said semi-conductor device when said lamps are to be extinguished.

3,963,941

AUTOMATIC LIGHT SWITCH AND BATTERY DISCONNECT

Oscar H. Banker, 261 Breezewood Drive, Bay Village, Ohio 44140

Filed Apr. 16, 1975, Ser. No. 568,693
Int. Cl.[2] H01H *47/18*
U.S. Cl. 307—10 BP **9 Claims**



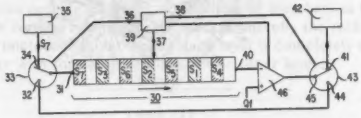
1. In a vehicle having lights, a control switch for the lights, a source of electric current, an ignition circuit for an internal combustion engine and an ignition switch in the ignition circuit having "on" and "off" positions, said ignition switch in its "on" position energizing both the ignition and accessories circuits, a thermally responsive relay switch having a heating element and a single pole, double throw switch responsive to the temperature of said heating element, the pole of said last-mentioned switch being connected at one end to the control switch for the lights, one contact of the double throw switch being connected to the accessories circuit and the other contact of said double throw switch being connected to the source of electric current, whereby upon setting the ignition switch in its "on" position, the source of electric current is connected to the light control switch through the accessories circuit and thereafter the source of electric current to the light switch is dependent only upon the thermally responsive relay switch for supplying current to the light control switch.

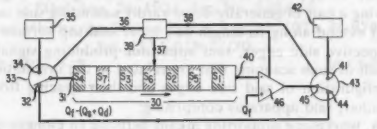
3,963,942

SEMICONDUCTOR CHARGE TRANSFER DEVICES WITH DARK CURRENT BACKGROUND CANCELLATION

Carlo Heinrich Sequin, New Providence, and Peter Van Dyke Wilde, Bernardsville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 6, 1975, Ser. No. 556,135
Int. Cl.[2] H03K *3/353;* **H01L** *29/78*
U.S. Cl. 307—221 D **8 Claims**





1. Semiconductor apparatus which comprises:

a. a semiconductor charge transfer device having a single input transfer device terminal and a single output transfer device terminal;

b. an inverter having an inverter output terminal, said output device terminal connected to an input terminal of the inverter;

c. a single input signal source terminal;

d. an input feedback terminal;

e. an output feedback terminal connected to the input feedback terminal;

f. first electrical switching means for connecting the input device terminal in periodic alternate succession to one of the input signal source terminal and the input feedback terminal;

g. second electrical switching means for connecting the inverter output terminal alternately to one of a utilization means terminal and the output feedback terminal which is connected to the input feedback terminal; and

h. clock cycle means for producing periodic cycles of charge transfer in the device and for controlling the first and second switching means, each cycle comprising a phase from each of a first and second periodic sequence of clock phases, such that the inverter output terminal is connected to the input device terminal through the input feedback terminal during the first periodic sequence of clock phases and is connected to the utilization means during the second periodic sequence of clock phases interlaced with and complementary to the first sequence, and such that the input device terminal is connected to the input signal source during said second sequence of clock phases.

3,963,943

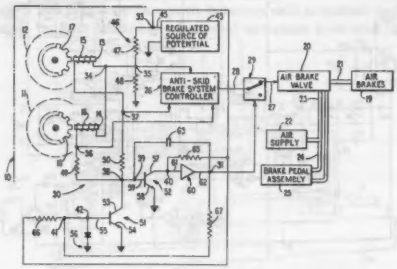
ANTI-SKID BRAKE CONTROL SYSTEM AND FAILSAFE CIRCUIT THEREFOR

Said Sapir, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 495,227, Aug. 6, 1974, Pat. No. 3,917,359. This application Apr. 2, 1975, Ser. No. 564,489

Int. Cl.² H03K *5/20*

U.S. Cl. 307—235 T **1 Claim**



1. In electrical apparatus, the combination comprising: first and second circuit components for producing first and second variable currents, respectively; and amplifier means connected from said first and second circuit components for producing a first predetermined output signal when the sum of said first and second currents is greater than the magnitude of a predetermined constant current, and for producing a second predetermined output signal different from said first predetermined output signal when the sum of said first and second currents falls below the magnitude of said predetermined constant current, a regulated source of potential being provided having a first output lead connected to a point of reference potential, and a second output lead, said circuit components each having a first lead connected from the second output lead of said source, and a second lead, first and second transistors each having a collector, an emitter and a base, a first resistor connected from the second output lead of said source to said first transistor base, an amplifier having an input lead and an output lead, a second resistor connected from said amplifier input lead to the second output lead of said source, a third resistor connected from said amplifier output lead to said first transistor base, a diode connected from said first transistor base to said point of reference potential, both of said emitters being connected to said point of reference potential, a fourth resistor connected from the second lead of said first circuit component to said second transistor base, a fifth resistor connected from the second lead of said second circuit component to said second transistor base, a capacitor connected from said amplifier output lead to said second transistor base, said amplifier means output signals being produced on said amplifier output lead, said first transistor collector being connected from said second transistor base, said second transistor collector being connected to said amplifier input lead.

3,963,944

DEVICE FOR CONVERTING AN ANALOGOUS SIGNAL INTO A PULSE-LENGTH-MODULATED PULSE SERIES

Leif Kristiansen, Trangsund, Sweden, assignor to Cemo Instruments AB, Vallingby, Sweden

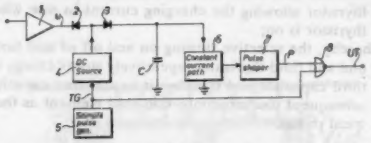
Filed Nov. 20, 1974, Ser. No. 525,452

Claims priority, application Sweden, Nov. 23, 1973, 7315915

Int. Cl.² H03K *1/12, 1/18*

U.S. Cl. 307—265 **3 Claims**

1. Device for converting an analogous signal having a varying amplitude into a pulse series having a pulse width proportional to the prevailing amplitude of the analogous signal, comprising means responsive to said analogous signal for providing an electric potential proportional to the prevailing amplitude of the analogous signal; a capacitor; a current source; a sample pulse generator for generating repetitive sample pulses; means responsive to said sample pulses for connecting said capacitor operatively to said potential and said current source for the duration of each sample pulse for charging said capacitor from said current source up to said potential; a constant current discharge path having a constant



current value lower than the current value of said current source and permanently connected directly across said capacitor; current detecting means for detecting the presence and absence of a current flow in said constant current discharge path and producing an output signal in the absence of a current flow in said constant current discharge path; and NOR circuit means having a first input receiving said sample pulses and a second input receiving said output signal of said current detecting means and an output on which said pulse series having a pulse width proportional to the prevailing amplitude of the analogous signal is provided.

3,963,945

DEVICE FOR PRODUCING ELECTRICAL PULSES

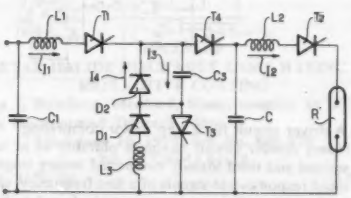
Roland Colyn, Le Perreux-sur-Marne, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Mar. 13, 1976, Ser. No. 558,100

Claims priority, application France, Mar. 14, 1974, 74.08745

Int. Cl.² H01S *3/09;* **H03K** *3/57*

U.S. Cl. 307—268 **1 Claim**



1. A device for producing electrical pulses in a load element connected to the device, and comprising:

a first capacitor;

a charging circuit for the first capacitor and comprising an alternating current voltage source rectified by a bridge, a second capacitor the plates of which are connected respectively to the outputs of the bridge, the plates of the second capacitor also being connected respectively to the plates of the first capacitor;

a first branch connected in parallel with said first capacitor between said first and second capacitors, the first branch comprising, in series, a third capacitor and a first thyristor, said first thyristor allowing a current to pass through said third capacitor when the thyristor is on;

a second branch connected in parallel with said first capacitor between said first and second capacitors, the second branch comprising in series a first inductance, a first diode, and a second diode, the first diode and the first inductance being in parallel with the first thyristor, said

first diode allowing a current to pass in said third capacitor when said first thyristor is off, that current flowing in the opposite direction to that which crosses said third capacitor when said first thyristor is on, said first and second diodes being poled in the same direction in said second branch;

a second inductance and a second thyristor connected in series in the charging circuit between said second capacitor and said branches, the second thyristor allowing the charging current to pass when the thyristor is on; and

a third thyristor connected in series in the charging circuit between said branches and said first capacitor, the third thyristor allowing the charging current to pass when the thyristor is on;

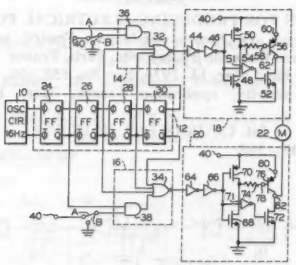
whereby, the selective turning on and off of said first, second and third thyristors repetetively stores energy in said third capacitor and transfers it to said first capacitor for subsequent discharge into said load element as the electrical pulses.

3,963,946

DRIVER CIRCUIT FOR STEP MOTOR

Chester J. Zajac, Litchfield, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 21, 1975, Ser. No. 551,866
Int. Cl.² H07K 17/00
U.S. Cl. 307—270 8 Claims



1. A driver circuit for a step motor comprising

a binary divider circuit having a plurality of at least first, second and third serially connected binary stages and an input responsive to signals of a first frequency, said stages having respective outputs upon which pulses having respective decreasing frequencies corresponding to succeeding divisions of the first frequency are generated;

first gating means having a plurality of at least first, second and third inputs with the first and second inputs of the first gating means connected to the outputs of the respective second and third stages, said first gating means having an output upon which pulses of a frequency determined by the frequency on the output of the third stage are produced;

amplifier means connected to the output of the first gating means for generating motor driving pulses;

second gating means having a first input, a second input, and an output, the first input of the second gating means connected to the output of the first stage of the divider circuit, the output of the second gating means connected to the third input of the first gating means; and

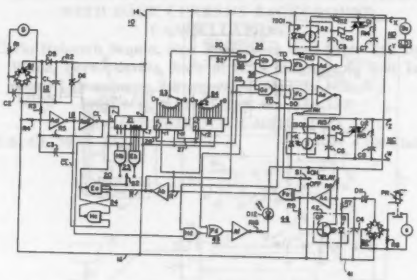
means, connected to the second input of the second gating means, for selecting the operation of the second gating means to determine the width of pulses produced by the amplifier means.

3,963,947

DIGITAL TIME DELAY RELAY UTILIZING LOGIC ELEMENTS

George F. Bogel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1974, Ser. No. 501,430
Int. Cl.² H03K 5/13; H01H 47/18; G05F 1/40
U.S. Cl. 307—293 10 Claims



1. A solid-state relay, comprising:

a. control means for actuating solid-state contact means to change state; and

b. a pair of complementary solid-state contact means interconnected with said control means one of which is generally opened and the other of which is generally closed, said control means actuating each of said solid-state contact means to change state in which case said contact means which is closed will always open before said contact means which is opened will close, each said solid-state contact means comprising a light emitting means interconnected with said control means which produces light in relationship to a signal from said control means, each said contact means also comprising light sensitive resistance means disposed in light accepting relationship with said light emitting means for changing resistance between a higher and lower value of resistance in relationship to the change of light in the vicinity of said resistance means, said light sensitive resistive means controlling the state of said contact means, a predetermined amount of change of said resistance causing said associated contact means to change state, said change of said resistance from said lower value of resistance to said higher value of resistance occurring at a different rate than said change of resistance from said higher value of resistance to said lower value of resistance consequently causing one said contact means to open before said other contact means closes.

3,963,948

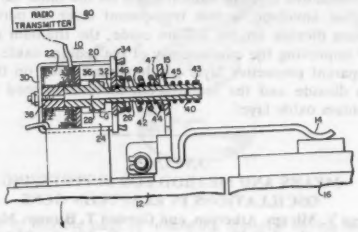
MAGNETIC PULSE GENERATOR

Walter V. Bratkowski, McKeesport, and John A. Wafer, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1975, Ser. No. 552,833
Int. Cl.² H02K 35/06
U.S. Cl. 310—15 4 Claims

1. A bi-stable magnetic pulse generator assembly, comprising an elongated armature adapted for lineal movement along the longitudinal axis, a single magnet assembly having pole pieces positioned in a radial relationship with respect to said armature to establish an air gap therebetween and provide a passage therebetween to support the lineal movement of said armature, electrical coil means operatively associated with said magnet assembly, magnetic circuit means for magnetically latching said armature through said single magnet assembly in both a first and second stable position, and actuator means coupled to said armature to respond to an actuating force which is applied in a direction opposing the magnetic

force latching said armature in either said first or second stable position to rapidly move said armature to said other stable position when the actuating force exceeds said magnetic force independent of the rate at which the actuating force is applied, said magnetic circuit means providing a first and second magnetic circuit through said single magnet assembly, said first magnetic circuit corresponding to the magnetic flux path established between said armature and said single magnet assembly when said armature is in said first stable position, and said second magnetic circuit corresponding to the magnetic flux path between said armature and said single magnet assembly when said armature is in said second



stable position, said single magnet assembly producing a magnetic flux transfer from said first magnetic circuit to said second magnetic circuit in response to movement of said armature from said first stable position to said second stable position and producing a magnetic flux transfer from said second magnetic circuit to said first magnetic circuit in response to movement of said armature from said second stable position to said first stable position, said magnetic flux transfer enhancing the movement of said armature from said one stable position to the other stable position, said electrical coil means responding to the changes in magnetic flux caused by the movement of said armature between said first and second stable positions by producing electrical pulses.

3,963,949

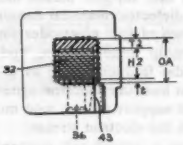
LAMINATED STRUCTURE WITH INSULATING MEMBER FORMED IN SITU THEREON

Ralph E. Church, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 301,162, Oct. 26, 1971, Pat. No. 3,813,763, which is a division of Ser. No. 99,049, Dec. 17, 1970, Pat. No. 3,709,457. This application Feb. 6, 1974, Ser. No. 439,895

Int. Cl.² H02K *1/04*

U.S. Cl. 310—43 **13 Claims**



1. An insulated magnetizeable laminated core assembly for use in a dynamoelectric machine having a stator and rotor; the insulated core assembly comprising a plurality of magnetizeable laminations arranged in a stack having an actual stack height within a preselected range; and a molded in situ body of insulation supported on the stack of magnetizeable laminations; said molded in situ body of insulation having a portion along one surface of the stack of laminations with a first thickness, and at least one other portion having a thickness greater than the first thickness by an amount that is dependent on the actual stack height.

3,963,950

STATOR OF ROTARY ELECTRIC MACHINE

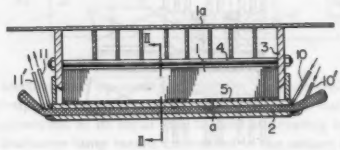
Masatoshi Watanabe; Noriyoshi Takahashi, and Miyoshi Takahaski, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,958

Claims priority, application Japan, Oct. 17, 1973, 48-115908; Nov. 30, 1973, 48-133501

Int. Cl.² H02K *1/20*

U.S. Cl. 310—54 **2 Claims**



1. A stator for a rotary electric machine comprising an annular stator core, a stator winding including a plurality of fine strands and arranged at the inner surface of said stator core, and a plurality of cooling pipes in the form of a separate cylindrical frame fitted onto the inner surface of said stator core, said strands of said winding being supported by said cylindrical frame of said cooling pipes, in which said cylindrical frame of cooling pipes includes in at least double layers of cooling pipes, said strands of said winding being securely supported between said double layers of said cylindrical frame of cooling pipes, and in which said strands of said windings are disposed in winding sections, each of said sections being securely supported between respective adjacent ones of said plurality of cooling pipes in each of said double layers of said cylindrical frame.

3,963,951

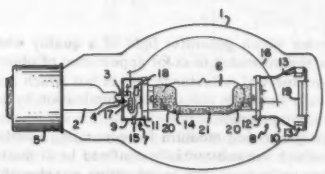
METAL HALIDE DISCHARGE LAMP HAVING A REFLECTIVE COATING

William I. Ramberg, Medford, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 20, 1975, Ser. No. 588,578

Int. Cl.² H01J *61/52*

U.S. Cl. 313—44 **3 Claims**



1. In a metal halide arc discharge lamp of the type having an arc tube having electrodes at each end thereof and containing a fill including mercury, metal halide and a starting gas, the improvement which comprises a stripe of heat reflecting material longitudinally extending across the bottom of the arc tube when the arc tube is in a horizontal position.

3,963,952

HEAT-DISSIPATING DEVICE FOR THE COLLECTOR OF TRAVELING-WAVE TUBE

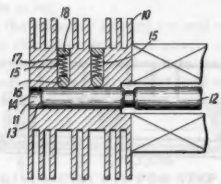
Ryuzo Orui; Genichi Goto, and Toshio Yamaguchi, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed May 19, 1975, Ser. No. 578,942

Claims priority, application Japan, May 29, 1974, 49-60756[U]

Int. Cl.² H01J 7/24

U.S. Cl. 313—45 4 Claims



1. A heat-dissipating device for the collector of a traveling-wave tube of the type in which the collector is loosely fitted in an axial aperture formed in a solid heat-dissipating member, said heat-dissipating device comprising at least one radial hole formed in the wall of said axial aperture and opening thereto, a contacting element accommodated in said radial hole and having a spherical surface for contacting engagement with the collector fitted in said axial aperture, and biasing means arranged in said radial hole radially outwardly of said contacting element and fixed at one end to act at the other end to urge said contacting element into pressure contact with said collector.

3,963,953

COLOR MISMATCH ACCENTUATING DEVICE

William A. Thornton, Jr., Cranford, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1975, Ser. No. 572,815

Int. Cl.² H01J 63/04

U.S. Cl. 313—487 6 Claims

1. A device which generates light of a quality which will accentuate the mismatch in color appearance of objects having different spectral reflectance curves but which appear at least generally similar in color under illumination by daylight, said device comprising:

a. a light generating medium for generating visible radiations which are substantially confined to at least two of the four color mismatch accentuating wavelength ranges and which are not substantially confined to two complementary color wavelength ranges, said color-mismatch-accentuating wavelength ranges consisting of:

i. from 405 to 435 nm,

ii. from 475 to 505 nm,

iii. from 565 to 595 nm,

iv. from 645 to 675 nm; and

b. means for energizing said light generating medium to a light generating condition.

3,963,954

FLUORESCENT LAMP HAVING INDIUM OXIDE CONDUCTIVE COATING AND A PROTECTIVE COATING THEREFOR

Howard W. Milke, Danvers, and Tadius T. Sadoski, Salem, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 25, 1974, Ser. No. 526,557

Int. Cl.² H01J 61/35, 61/42, 61/54

U.S. Cl. 313—489 2 Claims

1. In a fluorescent lamp having a glass envelope containing low pressure mercury vapor and an internal coating of luminescent material, the improvement comprising a thin transparent conductive layer of indium oxide on the inner surface of the glass envelope, a thin transparent layer of particulate titanium dioxide on the indium oxide, the titanium dioxide layer improving the conductivity of the indium oxide, a thin transparent protective layer of aluminum oxide on the titanium dioxide and the luminescent material coated on the aluminum oxide layer.

3,963,955

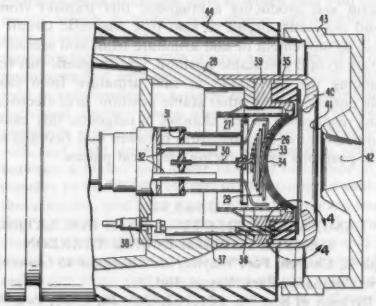
MEANS AND METHOD FOR SUPPRESSING OSCILLATIONS IN ELECTRON GUNS

George V. Miram, Atherton, and Gordon T. Hunter, Mountain View, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Apr. 15, 1974, Ser. No. 460,860

Int. Cl.² H01J 23/08

U.S. Cl. 315—5.34 7 Claims



1. An electron gun comprising a plurality of electrodes shaped to generate a stream of electrons and direct said stream emergent from said gun, support means positioning said electrodes said support means including a member of direct current dielectric material forming an insulating support between two of said electrodes for maintaining a fixed spaced relationship therebetween, said material presenting high loss at radio frequencies so as to reduce the resonant impedance of at least one electromagnetic mode of said electrodes and said support means, said mode comprising fields interacting with the electron stream.

3,963,956

ARTICLE FOR INCREASING THE LIFE EXPECTANCY OF FILAMENT LIGHT BULBS

August H. Beining, 818 N. Adlena Drive, Fullerton, Calif. 92633

Filed Apr. 16, 1975, Ser. No. 568,502

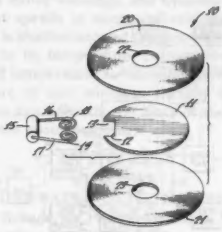
Int. Cl.² H01K 1/62

U.S. Cl. 315—71 8 Claims

1. An article positionable in a conventional light bulb socket comprising:

a wafer of insulating material having a width smaller than the inside diameter of the base of said light bulb socket;

a power decreasing device positioned adjacent to or in contact with a portion of the perimeter of said wafer, the leads of said device extending radially inwardly, on opposite sides of said wafer, into contact with electrical terminals at the center of said wafer;



a pair of flexible pads of insulating material having widths approximately equal to said inside diameter of said base of said light bulb socket, said pads being positioned on opposite sides of said wafer, each pad having a central opening therein to expose said electrical terminals; and

an adhesive securing the central portions of said pads to opposite sides of said wafer and the outer portions thereof to opposite sides of said device and to each other.

3,963,957

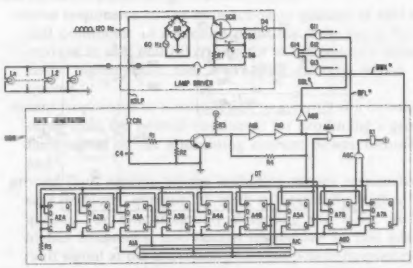
LAMP POWER SUPPLY ARRANGEMENT FOR KEY TELEPHONE SYSTEM

Dieter John Henry Knollman, Arvada, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 7, 1974, Ser. No. 521,648

Int. Cl.² H05B *37/00;* **H04L** *11/14;* **H03K** *17/68*

U.S. Cl. 315—200 A **10 Claims**



1. A lamp rate generator for driving a load including a variable number of key line lamps without abrupt current changes, comprising

a source of unfiltered full-wave half-sinusoids,

means for detecting zero-crossings of said half-sinusoids,

means for counting predetermined numbers of said zero-crossings,

SCR means having its source and drain electrodes interposed between said source and said lamp load, and

means controlled by said counting means for delivering control signals to the gate electrode of said SCR in synchronism with said zero-crossings.

3,963,958

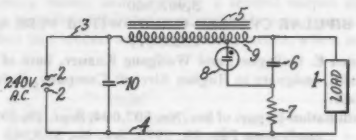
STARTING AND OPERATING CIRCUIT FOR GASEOUS DISCHARGE LAMPS

Joe A. Nuckolls, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 674,508, Oct. 11, 1967, abandoned. This application Nov. 18, 1974, Ser. No. 524,654

Int. Cl.² H05B *37/00*

U.S. Cl. 315—276 **9 Claims**



1. A starting and operating circuit for gaseous discharge lamps comprising a source of alternating current, ballasting means connected at its input side to said alternating current source, discharge lamp means connected to the output side of said ballasting means, and high voltage starting means having a series discharge loop including a portion of said ballasting means connected to said ballasting means at its output side for providing a high voltage starting pulse on said discharge lamp means, said ballasting means comprising inductance coil means having a plurality of turns, said high voltage starting means comprising a charging capacitor and a resistor connected in series across said discharge lamp means, and voltage sensitive symmetrical switch means having a predetermined breakdown voltage connected across said charging capacitor and a predetermined number of turns of said inductance coil means at its output side and forming therewith a series discharge loop, said inductance coil means stepping up the voltage produced across said predetermined number of turns by operation of said discharge loop, said ballasting means comprising a linear reactor connected in series between said alternating current source and said discharge lamp means.

3,963,959

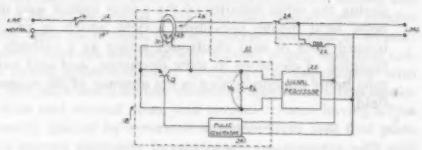
GROUND FAULT CIRCUIT INTERRUPTING DEVICE AND DIFFERENTIAL CURRENT SENSOR THEREFOR

Edward Keith Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 509,462, Sept. 9, 1974. This application Apr. 28, 1975, Ser. No. 571,930

Int. Cl.² H02H *3/28*

U.S. Cl. 317—9 R **11 Claims**



1. A sensor for utilization in a ground fault circuit interrupting device wired into a power distribution circuit comprising at least one line conductor and a neutral conductor, said sensor comprising, in combination:

A. a differential current transformer including

1. a core in which is developed a magnetic flux occasioned by a current imbalance in the line and neutral conductors of the distribution circuit, and

2. a secondary winding wound on said core;

B. an output element connected across said secondary winding for developing a signal voltage indicative of the magnitude of secondary current developed as the result of the current imbalance;

C. a switch connected across said secondary winding in shunt with said output element; and

D. means controlling said switch to convert from a closed condition, short circuiting said secondary winding and shunting secondary current from said output element, to an open condition, diverting said secondary current through said element pursuant to developing said signal voltage.

3,963,960

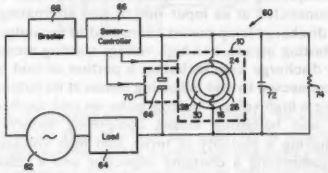
BIPOLAR CROSSED-FIELD SWITCH TUBE AND CIRCUIT

Hayden E. Gallagher, and Wolfgang Knauer, both of Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 507,094, Sept. 18, 1974. This application Feb. 28, 1975, Ser. No. 553,965

Int. Cl.² H02H *7/22*; **H01J** *1/50*

U.S. Cl. 317—11 A **10 Claims**



1. A bipolar crossed-field switch tube for installation in an electric power system where voltage of either polarity may be applied to the switch tube comprising:

an outer tubular electrode to act as cathode during one polarity of the power system;

an intermediate tubular electrode positioned within said outer tubular electrode to act as cathode during the other polarity of the power system and to define an outer annular inter-electrode space;

an inner electrode positioned within said intermediate electrode to define an inner annular inter-electrode space;

means for selectively providing a concave outward shaped magnetic field in both of said inter-electrode spaces; and

means for connecting said inner and said outer electrodes together into one power system pole and means for connecting said intermediate electrode to the other power system pole so that one of said connected together electrodes acts as a cathode during one polarity of the power system and said intermediate electrode acts as a cathode during the other polarity of the power system said magnetic field means providing a field which is concave toward both of said electrodes acting as a cathode for trapping of electrons in glow discharge, and said switch tube being nonconductive in the absence of the magnetic field.

3,963,961

CATHODE RAY TUBE PHOSPHOR PROTECTION CIRCUIT

Thomas J. Ray, Yonkers, N.Y., and Glenn C. Waehner, Riverside, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1974, Ser. No. 536,042

Int. Cl.² H01J *29/52*

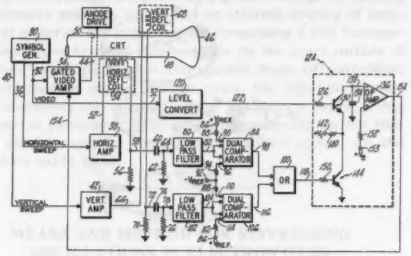
U.S. Cl. 315—381 **4 Claims**

1. Apparatus for protecting against damage of a CRT phosphor screen which provides a visual image in response to video, horizontal sweep, and vertical sweep input signals in a system having a source of video signals, a source of horizontal sweep signal, and a source of vertical sweep signal, comprising:

a gated video amplifier connected for response to the video source and having a gate signal input, said video amplifier selectively operable in response to a gating signal applied to said gate input to provide video signals to the CRT;

means connected to the horizontal and vertical sweep signal sources for providing an enable signal in response to the presence of either of the sweep signals having a rate of change in excess of a given magnitude; and

means connected for response to the source of video signals and to said enable signal, and having an output connected



to said gate input, said output normally providing said gating signal to said video amplifier in response to the absence of video signals and in response to the concurrent presence of video signals and said enable signal, said output cutting off said gating signal within a determined time interval in response to the presence of video signals in the absence of a concurrent enable signal within said determined time interval, the duration of said determined time interval being less than that required for unswept video to damage the phosphor screen of the CRT in the absence of said enable signal.

3,963,962

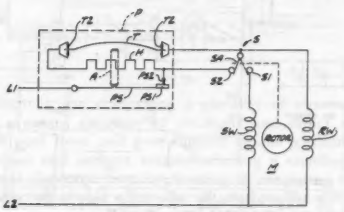
MOTOR PROTECTOR

Walter T. Sutton, Lexington, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 18, 1973, Ser. No. 425,897

Int. Cl.² H02H *7/08*

U.S. Cl. 317—13 B **4 Claims**



1. A motor protector for a split-phase motor having start and run windings and a start switch having a switch arm connected to the run winding and which moves from a first position in engagement with a first contact to energize the start winding into a second position in engagement with a second contact thereby to deenergize said start winding upon the motor attaining a predetermined starting speed, said protector comprising a thermostatic element adapted to be positioned in heat-exchange relationship with said windings and to be heated by the flow of electrical current therethrough, said element having a first curvature position at ambient temperatures and moving to a second curvature position at an elevated predetermined temperature, and a switch having contacts which are opened in response to movement of said thermo-

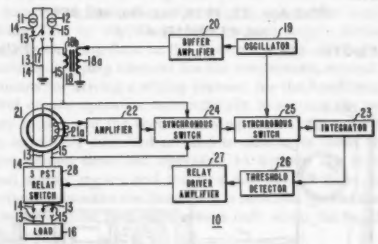
static element into its second curvature position, said thermostatic element adapted to be serially connected with the contacts of the last said switch in a circuit between one terminal of an a.c. power source and the switch arm, said thermostatic element adapted to be shunt-connected across said switch arm and said second contact whereby while the motor is operating below its starting speed the thermostatic element is responsive to motor overcurrent conditions that cause self-heating of the element to the elevated predetermined temperature thereby to open the contacts of the last said switch and deenergize the motor windings, and whereby while the motor is operating at speeds in excess of said starting speed the motor current is shunted around the thermostatic element and is responsive to its temperature rising above the predetermined elevated temperature substantially as a sole function of the temperature of said windings thereby to move into its second position and open the contacts of the last said switch to deenergize the motor windings.

3,963,963

GROUND-FAULT DETECTION SYSTEM

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 22, 1975, Ser. No. 570,434
Int. Cl.² H02H *3/28*
U.S. Cl. 317—18 D **5 Claims**



1. A ground-fault detector for an alternating current power system, employing a plurality of conductors, the neutral one of said conductors being connected to ground at one point, said detector comprising, in combination;

means responsive to the connection to ground of said neutral conductor at a second point for inducing a flow of current in said neutral conductor at a frequency substantially higher than the alternating current power frequency;

means responsive to a connection to ground of a conductor other than the neutral conductor for producing a ground fault signal at the alternating current power frequency; and

ground fault sensing means including means responsive to said induced current at said substantially higher frequency for synchronously detecting the same at said higher frequency, and means responsive to said ground fault signal at the alternating current power frequency for synchronously detecting the same at said alternating current power frequency.

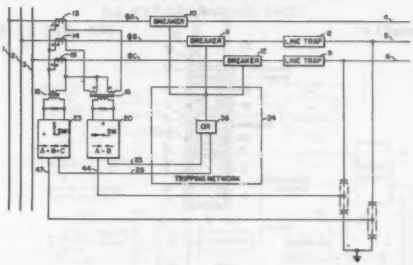
3,963,964

SEGREGATED PHASE COMPARISON SYSTEM

Kalyan K. Mustaphi, Minneapolis, Minn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 7, 1975, Ser. No. 548,130
Int. Cl.² H02H *3/28*
U.S. Cl. 317—27 R **6 Claims**

1. A phase comparing relay for protecting a line section of a three phase power transmitting network, said relay comprising, a plurality of current sensing means, a first and a second and a third of said sensing means being individually associated with the phase conductors of said line section at a first location therealong and providing output current quantities proportional to the phase and magnitude of the current in the said phase conductor with which it is associated, first current quantity summing means connected to said first and said second sensing means and providing a first output signal which is a measure of the phase difference of said current quantities of said first and second sensing means, second current quantity summing means connected to said first and second and third sensing means and providing a second output signal which is a measure of the phasor sum of said current quantities of said first and second and third sensing means, a first and a



second signal comparing means, a first signal receiving means adapted to receive a first and a second transmitter signal, circuit means interconnecting said first and second comparing means with said first and second summing means respectively and with said first receiving means for energization of said first comparing means with said first output signal and said first transmitted signal and for energization of said second comparing means with said second output signals and said second transmitted signal, a first actuating circuit connected to said first and second comparing means, each of said first and second comparing means being effective to actuate said first actuating circuit at predetermined relationships of the said signals supplied thereto.

3,963,965

SURGE ARRESTER CONSTRUCTION

Ned T. Kunkle, Bloomington, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 22, 1974, Ser. No. 516,922
Int. Cl.² H02H *9/06*
U.S. Cl. 317—61 **5 Claims**

1. An electrical surge arrester comprising: first, second and third conductive plates, each generally planar and parallel spaced from each other; first and second columns of arrester elements between said first and second plates, said first column having a first extremity in conductive engagement with said first plate and a second extremity spaced by a first insulator from said second plate, said second column having a first extremity spaced by a second insulator from said first plate and a second extremity in conductive engagement with said second plate; and third and fourth columns of arrester elements between said second and third plates, said third column having a first extremity in conductive engagement with said second plate and a second extremity spaced by a third insulator from said third plate, said fourth column having a first extremity spaed by a fourth insulator from said second plate and a second extremity in conductive engagement with said third plate; a first connector connecting said second extremity of said first column with said first extremity of said second column and a second connector connecting said second extremity of said third column and said first extremity of said fourth column to form a series electrical connection in sequence including said first plate, said first column, said first connector, said second column, said second plate, said third

column, said second connector, said fourth column and said third plate.

3,963,966

HAMMER FOR A PIEZOELECTRIC IGNITER

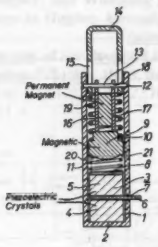
Walter Mohr, Frankfurt am Main, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 14, 1974, Ser. No. 469,746

Claims priority, application Germany, May 14, 1973, 2324227; May 14, 1973, 2324229

Int. Cl.[2] F23Q 3/00; H01L 41/08

U.S. Cl. 317—81 7 Claims



1. A piezoelectric igniter for lighters, including a cylindrical housing having a closed bottom, a piezoelectric transducer positioned adjacent the bottom of said housing, a hammer of magnetic material axially movably guided in said housing towards impact with said piezoelectric transducer, an actuating member at the top of said housing and axially movable with respect to said housing, a compression spring disposed between said actuating member on the one hand and said hammer on the other hand, and a magnetic retentive means comprising a magnet having pole plates fixed to opposite sides thereof, said magnetic retentive means being fixedly supported by said housing between said actuating member and said hammer, said magnetic retentive means being magnetically coupled to said hammer to retain said hammer in a rest position, said compression spring surrounding said magnetic retentive means, and a retraction means for returning said hammer to said rest position after impact with said piezoelectric transducer.

3,963,967

CONTACTOR INTERLOCK CIRCUITS

David Gurwicz, and Albert Everett Sloan, both of Gateshead, England, assignors to Sevcon Engineering Limited, Gateshead, England

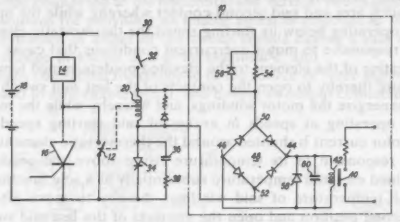
Filed Nov. 21, 1974, Ser. No. 526,060

Claims priority, application United Kingdom, Nov. 23, 1973, 54475/73

Int. Cl.[2] H01H 47/00

U.S. Cl. 317—123 9 Claims

1. A contactor interlock circuit for use with an electromagnetically actuated contactor having an actuating coil which is connectible through switch means to a d.c. source and has an armature which moves on energisation of the actuating coil to close the contactor tips and which on de-energisation of the actuating coil moves to open the contactor tips and to create an air-gap in the magnetic circuit of the coil, the interlock circuit comprisng a voltage sensing circuit connected in parallel with the actuating coil of the contactor in such a manner as to provide a unidirectional current path through which inductive energy in the coil is dissipated when the switch means is operated to disconnect the coil from the d.c. source, the voltage sensing circuit sensing the voltage across the actuating coil and providing an output signal when the modulus of said voltage exceeds a predetermined value which is lower than the modulus of said voltage appearing across the coil at



the instant when the contactor tips open after opening of the switch means.

3,963,968

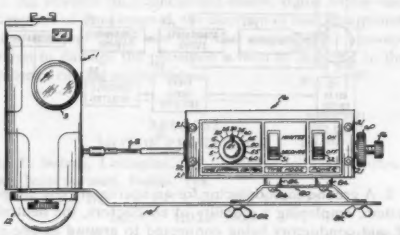
INTERVALOMETER APPARATUS

John M. Pierini, 103 Cambridge St., Winchester, Mass. 01890, and Leon E. Brown, 11017 Carissa Drive, Dallas, Tex. 75218

Filed Apr. 22, 1974, Ser. No. 462,989

Int. Cl.[2] H01H 47/18

U.S. Cl. 317—141 S 7 Claims



1. Shutter operating apparatus comprising a housing; shutter actuating means mounted in the housing; magnetomotive force generating means mounted in the housing for providing linear motion to the shutter actuating means; and circuit means coupled to the magnetomotive force means; the circuit means comprising a quadruple, two input positive NOR gate, the output of the first gate connected to the input of the second gate, a limiting first resistor and serially connected first capacitor connected across the first and second gates, variable resistance means connected between a point intermediate the limiting resistor and the first capacitor, and a point intermediate the first and second gates; a fourteen stage counter circuit, the output of the second gate connected to the input of the counter circuit; a double pole switch, a first pole of the switch connected to the eighth output stage of the counter circuit and a second pole connected to the fourteenth output stage of the counter circuit; the output of the third gate serially connected to a second capacitor which in turn is serially connected to the input of the fourth gate, the output of the fourth gate connected to the input of the third gate, a second resistor, the input of the fourth gate connected to ground through the second resistor, solid state switching means, the output of the third gate coupled to the solid state switching means, the solid state switching means connected to the magnetomotive force generating means and a source of power to energize the circuit means.

3,963,969

APPARATUS FOR WASHING AND WIPING VEHICLE WINDSCREENS AND HEADLAMPS

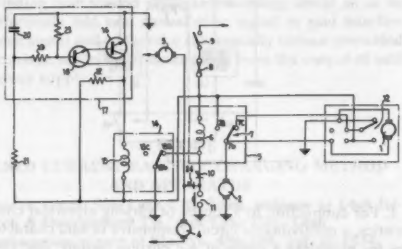
Harry Nottingham, Crewe, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Feb. 25, 1975, Ser. No. 553,064

Claims priority, application United Kingdom, Mar. 16, 1974, 11766/74

Int. Cl.² B60S 1/50

U.S. Cl. 318—443 12 Claims



1. Apparatus for washing and wiping vehicle windscreens and headlamps comprising first supply means for supplying cleaning fluid to the windscreen, second supply means for supplying cleaning fluid to the headlamp, first driving means for driving a wiping element for the windscreen, second driving means for driving a wiping element for the headlamp, and control means operative automatically to actuate the second supply means and the second driving means when the headlamp is initially switched on and to deactuate them after a predetermined time and operative to actuate the first and second supply means and the first and second drive means simultaneously when the headlamp is switched on and the first supply means and first drive means only when the headlamp is switched off.

3,963,970

CONTROL CIRCUIT FOR SERVO-MOTORS

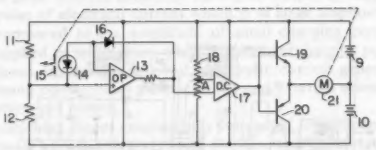
Yoshihiro Satake, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,528

Claims priority, application Japan, Sept. 6, 1973, 48-100695

Int. Cl.² G05B 1/06; G03B 7/08

U.S. Cl. 318—640 3 Claims



1. A control circuit for servo-motors comprising an operational amplifier, a photoelectric element having a diaphragm means in front thereof and connected between two input terminals of said operational amplifier, a logarithmic conversion element connected between one input terminal and an output terminal of said operational amplifier, a direct current amplifier having an input terminal connected to the output terminal of said operational amplifier, a bleeder resistor for setting information having a movable terminal connected to another input terminal of said direct current amplifier, and a servo-motor mechanically interlocked with said diaphragm means and connected to an output of said direct current amplifier, said control circuit being capable of controlling rotation and stopping of said servo-motor by making comparison between voltage at the movable terminal of said bleeder resistor and voltage at the output terminal of said operational amplifier.

3,963,971

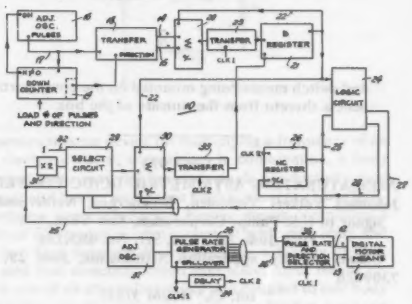
VELOCITY CHANGE CIRCUIT FOR A DIGITAL MOTOR

Albert C. Leenhouts, Harwinton; Peter Senak, Jr., and Arthur Emery, both of Bristol, all of Conn., assignors to The Superior Electric Company, Bristol, Conn.

Filed Dec. 19, 1974, Ser. No. 534,565

Int. Cl.² G05B 19/40, 19/28

U.S. Cl. 318—696 14 Claims



1. A circuit for accepting commands for a movement defined by a number of input pulses each representing an incremental step comprising digital motor means for receiving motor pulses and producing an incremental step for each motor pulse received with there being one motor pulse produced for each input pulse, means for subdividing the motor pulses into a plurality of consecutive groups, means for providing motor pulses at a plurality of different rates and means for selecting one of the rates for each of the groups, said selecting means including a first register means for maintaining a count of the number of pulses in a present group and a second register means for maintaining a count that varies in accordance with the difference between the number of input pulses remaining for which a motor pulse is to be produced and the number of motor pulses required to decelerate the motor to the end of the movement.

3,963,972

PORTABLE POWER PACKAGE

Gregory M. Todd, 1301 Hallbrook Drive, Columbia, S.C. 29210

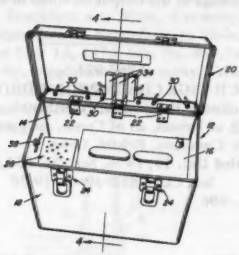
Filed Mar. 14, 1975, Ser. No. 558,304

Int. Cl.² H02J 7/00

U.S. Cl. 320—2 2 Claims

1. A portable power package, comprising, in combination:
   a. a supporting box having a cavity arranged for receiving an electric battery;
   b. an electric battery removably disposed in the cavity;
   c. charger means removably disposed in the cavity and electrically connected to the battery for selectively charging the battery;
   d. jack means mounted on the box and electrically connected to the battery for selectively receiving plugs of electrical devices; and
   e. switch means mounted on the box and electrically connected between the jack means and battery for selectively connecting and disconnecting the jack means to the bat-

tery; and the box includes a container portion and a cover portion hinged to the container portion, the jack means



and switch means being mounted on the cover portion for access thereto from the outside of the box.

3,963,973

NONSATURATING ASYMMETRIC DC/DC CONVERTER

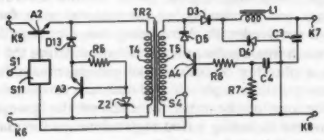
Johannes Volkert Vermolen, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 26, 1974, Ser. No. 483,136

Claims priority, application Netherlands, June 29, 1973, 7309056

Int. Cl.² H02M *3/335*

U.S. Cl. 321—2 9 Claims



1. A direct current converter, comprising a series connection of a first direct current input terminal, current interrupting means active in one direction, a first transformer winding connected to a gating circuit, and a second direct current input terminal, a second series connection of a first direct current output terminal, a rectifying element, a second transformer winding electromagnetically coupled to the first transformer winding, and a second direct current output terminal, means connecting the said second series connection to a smoothing circuit elememt, closure of the current interrupting means enabling first asymmetrical current pulses to be passed through the first transformer winding thereby blocking the gating circuit, the said pulses inducing at the same time second asymmetrical current pulses in the second transformer winding, opening of the current interrupting means inducing third asymmetrical current pulses in the first transformer winding which are oppositely directed from the first asymmetrical current pulses to open the gating circuit, means including an electric energy storage member connecting the direct current input terminals, the current interrupting means including a current interrupting member in each of the connection leads to the first transformer winding, the gating circuit comprising two branches which are cross-wise connected between connection leads from the first transformer winding to the current interrupting members and from the current interrupting members to the two direct current input terminals, respectively.

3,963,974

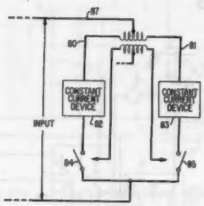
POWER SUPPLY CIRCUIT

William Emil Hess, Jr., Piscataway, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1975, Ser. No. 544,960

Int. Cl.² H02M *3/335*

U.S. Cl. 321—2 5 Claims



1. For connection to a source of varying electrical characteristics, a multivibrator circuit responsive to said characteristics for providing a constant a-c current output, said circuit including first and second electrical paths including first and second constant-current devices and first and second switches, respectively, and means for driving said first and second switches to open and closed or closed and open conditions in the alternative; wherein

said first and second constant-current devices and first and second switches comprise first and second transistors in said first and second electrical paths, respectively, and means for operating said transistors in a constant-current mode;

in combination with a rectifier circuit for providing a constant d-c current and a first capacitor responsive to said d-c current for providing a constant voltage, said combination also including a regulator circuit responsive to variations in said constant voltage for adjusting said constant a-c current output.

3,963,975

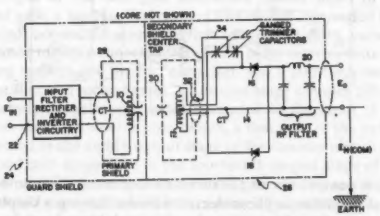
ELECTROMAGNETICALLY SHIELDED ELECTRICAL POWER SUPPLY WITH REDUCED COMMON MODE ELECTROMAGNETIC INTERFERENCE OUTPUT

Harold A. Gauper, Jr., Scotia, and John P. Walden, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,424

Int. Cl.² H02M *3/22*

U.S. Cl. 321—2 19 Claims



1. An electromagnetically shielded electrical power supply comprising:

an inverter driven transformer having primary and secondary windings,

an electrostatic shield about the secondary windings of the transformer,

other electrostatic shielding associated with other components of the power supply,

said secondary winding shield being electrically isolated from said other electrostatic shielding thereby giving rise to potential common mode interference signal superimposed on the electrical output from said secondary windings with respect to said other shielding,

signal pickup means for producing a cancellation signal substantially equal in magnitude and of substantially opposite phase with respect to said interference signal,

said signal pickup means being connected to said secondary winding and to said secondary winding shield so as to effectively add said cancellation signal to said interference signal and to thereby substantially reduce unwanted common mode signal emanations from the output of said power supply.

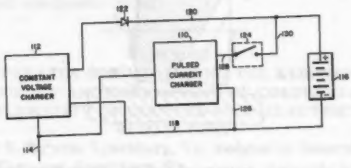
3,963,976
PULSED CURRENT BATTERY CHARGING METHOD AND APPARATUS

William H. Clark, Salt Lake City, Utah, assignor to Utah Research & Development Co., Salt Lake City, Utah

Continuation-in-part of Ser. No. 486,308, July 8, 1974, abandoned, which is a continuation of Ser. No. 302,027, Oct. 30, 1972, abandoned. This application Apr. 3, 1975, Ser. No. 564,825

Int. Cl.² H02J *7/04*

U.S. Cl. 320—21 **3 Claims**



1. A battery charging apparatus comprising:

a. an external source of electrical power;

b. a conventional battery charging apparatus to supply a conventional charging current as an output and conductively connected to said external source of electrical power;

c. a pulse current generator having an output to supply a pulse of electrical current which is of large amplitude as compared to the amplitude of small charging currents applied to said battery when battery overcharging procedures are being employed, said pulse current generator being conductively connected to said external source of electrical power;

d. switching means conductively connected to said conventional battery charger, to said pulse current generator and to a battery to switch the output of said conventional battery charging apparatus and the output of said pulse current generator into electrical circuit with said battery; and

e. control means connected to said switching means to cause said switching means to switch the output of said conventional battery charging apparatus and the output of said pulse current generator to be in electrical circuit with said battery to impart to said battery a preselected program of conventional and pulsed charging current wherein said conventional charging current and said pulse charging current alternate at a selected constant rate.

3,963,977
FREQUENCY MULTIPLIER WITH NONLINEAR SEMICONDUCTOR ELEMENT

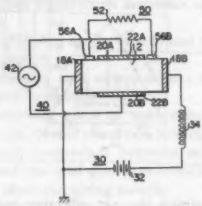
Shigeru Mitsui, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 345,591, March 28, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,022

Claims priority, application Japan, Mar. 31, 1972, 47-32207

Int. Cl.² H02M *5/20*

U.S. Cl. 321—69 NL **8 Claims**



1. A semiconductor device for multiplying a frequency of an applied electrical signal, comprising, in combination, a body of semiconductive material having a single conductivity type throughout and having an electric field-to current characteristic including a nonlinear region, biasing means comprising a first pair of electrodes in ohmic contact with said body and spaced in a first direction for establishing a biasing electric field in said first direction within said body, input means receptive in use of an alternating signal and coupled to said body for establishing an alternating input electric field in a second direction substantially orthogonal to said first direction within said body, said input means comprising a pair of dielectric films and a second pair of electrodes spaced in said second direction and disposed on said body with a respective one of said dielectric films disposed between each of the electrodes comprising said second pair and said body, and output means in ohmic contact with said body for providing a current component flowing in said first direction through said body, said output means comprising a third pair of electrodes spaced in said first direction and disposed on a surface of said body having one of the electrodes comprising said second pair disposed thereon, said biasing electric field and said alternating electric field forming a resultant time-varying electric field variable in at least said nonlinear region of the electric field-to-current characteristic in response to variations in said alternating input electric field whereby said current component provided by said output means has a frequency equal to a multiple of the frequency of said alternating input electric field.

3,963,978
REACTIVE POWER COMPENSATOR

Fred W. Kelley, Jr., Media, and Charles H. Titus, Newtown Square, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

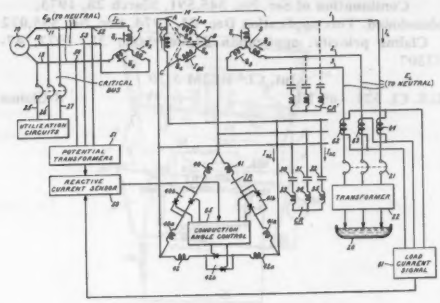
Filed Feb. 14, 1975, Ser. No. 550,090

Int. Cl.² H02J *3/18*

U.S. Cl. 323—102 **8 Claims**

1. Reactive current compensating apparatus for a multiphase alternating current electric power circuit having load terminals and load conductors and subject to varying reactive current demand at said load terminals comprising, a multiphase compensating reactor of controllable effective reactance, phase shifting means for coupling said compensating reactor to said load conductors effectively in shunt circuit relation across said load terminals, said phase shifting means supplying to said reactor a multiphase system of terminal voltages displaced in phase with respect to the line voltages at

said load conductors, means for generating signals proportional in each phase to the reactive component of current traversing each phase of a reactive multiphase electrical load connected to said load terminals, and means responsive to said



signals for maintaining the net effective reactance of each phase of said compensating reactor effectively substantially equal and opposite to the reactance of the associated phase of said electrical load.

3,963,979

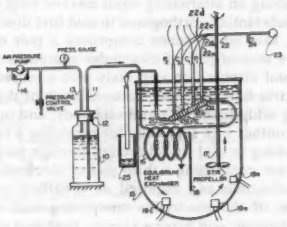
LIQUID CONDUCTIVITY MEASURING APPARATUS

Thomas M. Dauphinee, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 5, 1974, Ser. No. 495,100

Int. Cl.² G01N 27/42

U.S. Cl. 324—30 **6 Claims**



1. A liquid conductivity measuring apparatus for measuring the salinity of a liquid sample from a standard sample bottle or other container comprising:

a. an elongated tube having one end adapted for insertion into a sample bottle or container,

b. a measuring cell for measuring the conductivity of a water sample formed of a tube having an elongated main body portion connected at one end to the elongated tube and at the other to waste, four upwardly extending branch tubes connected to the main tube and having liquid seals at their upper ends, electrodes mounted inside the four branch tubes, two of the electrodes forming potential electrodes and the other two forming current electrodes, electrical leads passing through the seals and connected to the four electrodes,

c. means for controlling the temperature of said cell,

d. means for flushing the contents of the cell to waste between sample measurements, and

e. air pressure means for connection to the sample holder for positively forcing a portion of the liquid sample out of the sample holder into and through the said tube and into the means for measuring the conductivity, and

f. a conductivity measuring circuit connected to the potential and current electrode leads for measuring the conductivity of the liquid sample in the cell said circuit comprising: a standard resistance, a current source connected in series with the standard resistance and the current electrodes of the cell, a voltage comparator connected to the potential electrodes of the cell and to a source of regulated square wave voltage such as to compare the voltage across the potential electrodes and the square wave voltage such as to cause it to provide a current through the standard resistance and the current electrodes such that the voltage comparator is brought to a null, a linear voltage comparator connected across the standard resistance and to a voltage related to the regulated square wave voltage to compare this voltage and the voltage across the standard resistance and provide an output square wave voltage related to the conductivity of the cell, a square wave to DC amplifier connected to the linear voltage comparator for changing the output voltage to DC, a DC amplifier connected to the square wave to DC amplifier, and readout means connected to the DC amplifier.

3,963,980

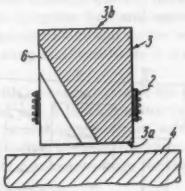
ULTRASONIC INSTRUMENT FOR NON-DESTRUCTIVE TESTING OF ARTICLES WITH CURRENT-CONDUCTING SURFACE

Jury Mikhailovich Shkarlet, Lefortovsky val, 12, kv. 40, Moscow, U.S.S.R.

Filed Aug. 29, 1973, Ser. No. 392,789

Int. Cl.² G01R 33/14

U.S. Cl. 324—40 **8 Claims**



1. An ultrasonic instrument for non-destructive testing of articles with a current-conducting surface, comprising: a generator generating current pulses; an electromagnetoacoustic transducer connected to said generator and having at least one inductance coil; a member with a current-conducting surface making up a closed loop, arranged between the inductance coil of said transducer and an article being tested in such a way that one portion of said surface of that member is inductively connected to said inductance coil and the other is arranged close to the surface of the article being tested; said member being made of a mechanically durable material in order to protect said inductance coil from mechanical damage; a recording system connected to said transducer and receiving signals from it, the member with a current-conducting surface being in the form of a cylinder, with the current-conducting surface thereof being formed by the lateral surface of that cylinder wound upon which is an inductance coil and by a channel provided in the zone of the winding of that coil which is opened at least at one of the end faces of the cylinder and communicates with the lateral surface thereof by means of a longitudinal slot.

3,963,981

LEAKAGE AND CONTINUITY TESTER

Vincent A. Vis, Brighton, Mich., assignor to J. M. Richards Laboratories, Grosse Points Park, Mich.

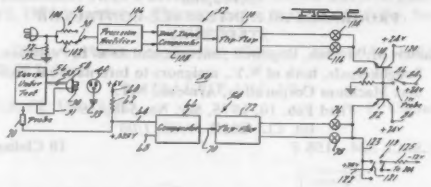
Filed Oct. 9, 1974, Ser. No. 513,222

Int. Cl.² G01R 31/02

U.S. Cl. 324—51 **19 Claims**

1. A test unit for testing the ground continuity and leakage characteristics of an electrical unit under test having a ground circuit and a chassis comprising a housing, means mounted on

said housing adapted to be connected to the ground circuit of the unit under test, means adapted to be connected to the chassis, ground continuity test circuit means connected to said chassis connection means including a power supply and a conductor connected to said chassis for supplying electrical current though said chassis to said ground circuit to establish an electrical potential signal across the impedance of said ground circuit, said continuity test circuit means including comparator circuit means including an input signal from said chassis connection means and a fixed input signal, a go-no go type ground output indicator circuit including digital output



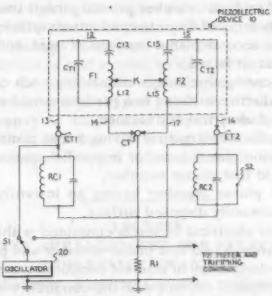
means to indicate the acceptable or defective condition of said ground circuit as determined by said comparator circuit, and leakage current test means including input circuit means connected to the leakage current circuit under test including dual comparator means for comparing positive and negative polarity leakage signals with a standard signal, said input circuit means including an operational amplifier connected as a precision rectifier to sense positive and negative polarity input signals, and go-no go leakage output indicator circuit including digital output means to indicate the acceptable or defective condition of said leakage circuit as determined by said dual comparator circuit.

3,963,982

APPARATUS FOR MEASURING THE RESONANT FREQUENCY AND COEFFICIENT OF COUPLING OF A PLURALITY OF COUPLED PIEZOELECTRIC RESONATORS

Gerald E. Roberts, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Sept. 17, 1974, Ser. No. 506,800
Int. Cl.² G01R *29/22*
U.S. Cl. 324—56 **5 Claims**



1. Apparatus for measuring the resonant frequency of each of a plurality of coupled piezoelectric resonators each having a separate electrode and a common electrode, and for measuring the coefficient of coupling between adjacent pairs of said resonators, said apparatus comprising:

a. a plurality of electrode terminals, each of said electrode terminals being adapted to be connected to a respective separate electrode of said resonators;

b. a common terminal adapted to be connected to said common electrodes of all said resonators;

c. a plurality of parallel resonant circuits, each of said parallel resonant circuits having a selected resonant frequency characteristic;

d. means connecting each of said parallel resonant circuits between one of said electrode terminals and said common terminal respectively, said selected resonant frequency characteristics of each of said parallel resonant circuits resonating with its respective resonator to produce a relatively high impedance in the vicinity of the resonant frequency of the adjacent resonators;

e. first and second signal input terminals adapted to receive a signal;

f. switch means having an input terminal and a plurality of output terminals;

g. means connecting said switch means input terminal to said first signal terminal;

h. means connecting each of said switch means output terminals to one of said electrode terminals respectively;

i. An impedance connected between said second signal input terminal and said common terminal;

j. at least one short-circuiting switch;

k. means connecting one of said short-circuiting switches in parallel with one of said parallel resonant circuits respectively;

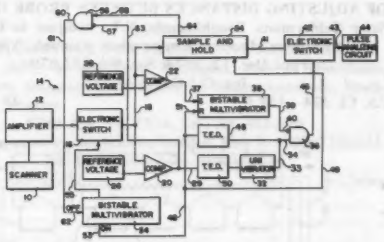
l. means connected to said impedance for measuring resonant frequencies in response to signals applied to said first and second signal input terminals.

3,963,983

PULSE AMPLITUDE DISCRIMINATING CIRCUIT

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 352,361, April 18, 1973, Pat. No. 3,810,011, which is a continuation-in-part of Ser. No. 40,231, May 25, 1970, Pat. No. 3,757,213. This application Oct. 16, 1973, Ser. No. 406,919
Int. Cl.² G01N *27/00*; H03K *5/20*
U.S. Cl. 324—71 CP **12 Claims**



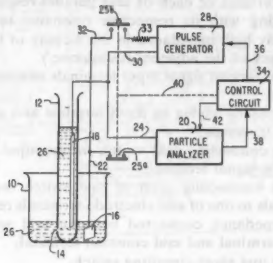
1. In a system where particles in a fluid are caused to flow through a sensing zone and a particle pulse is generated for each particle sensed with the amplitude of each pulse being related to the size of the particle sensed, the improvement comprising electric circuit means for determining which pulses having an amplitude falling between predetermined upper and lower amplitude levels, for remembering each pulse while said determination is being made and for passing to a pulse analyzing circuit only the pulse heights of those remembered pulses which have an amplitude falling between the predetermined upper and lower amplitude levels.

3,963,984

METHOD AND SYSTEM FOR CLEANING AN APERTURE IN A PARTICLE STUDY DEVICE

Wallace H. Coulter, Miami Springs, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Nov. 4, 1974, Ser. No. 520,711
Int. Cl.[2] B08B 3/10; G01N 27/02
U.S. Cl. 324—71 CP 12 Claims



1. In a particle study device having an aperture through which particles to be studied pass, which aperture clogs with debris, and wherein the particles are suspended in an electrically conductive fluid which flows through said aperture, an aperture cleaning system including in combination,

a first electrode positioned in said fluid an on one side of said aperture,

a second electrode positioned in said fluid and on the second side of the said aperture,

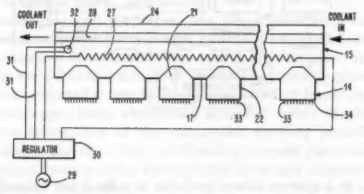
Pulse generation means for developing combinations of pulses, having a repetition rate approximately in the range of 5 to 100 KHz said electrodes being coupled to said pulse generation means and operative to couple said combinations of pulses through said fluid and said aperture between said first and second electrodes, said fluid in said aperture being responsive to said pulses passing therethrough to remove said debris clogging said aperture.

3,963,985

PROBE DEVICE HAVING PROBE HEADS AND METHOD OF ADJUSTING DISTANCES BETWEEN PROBE HEADS

Pieter Geldermans, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,079
Int. Cl.[2] G01R 31/02
U.S. Cl. 324—158 F 19 Claims



1. A probe device including:

support means formed of a material having a known coefficient of expansion;

said support means having a plurality of probe heads mounted thereon;

each of said probe heads having a plurality of probes arranged thereon in accordance with the arrangement of terminals in an area of a device with which said probes are to cooperate;

each of said probe heads being a selected distance from each of the adjacent of said probe heads in accordance with the design spacing of the areas on the device;

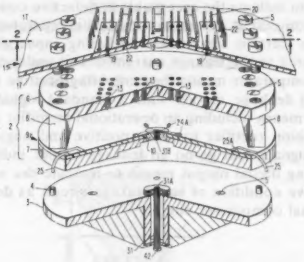
and means to change at least one of the length and width dimensions of said support means to change the selected distance of each of said probe heads from the adjacent of said probe heads in accordance with the change in spacing from each other of the areas on the device relative to the design spacing from each other of the areas on the device.

3,963,986

PROGRAMMABLE INTERFACE CONTACTOR STRUCTURE

Robert M. Morton, Hopewell Junction, and Ariel L. Perlmann, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,659
Int. Cl.[2] G01R 31/02, 1/06
U.S. Cl. 324—158 F 10 Claims



1. A Programmable Interface Contactor Structure used in a test system for testing semiconductor devices having high circuit density and where said devices each include a substantially planar surface having an array of conductive pads disposed thereon, said Programmable Interface Contactor Structure comprising:

a part number printed circuit board having first and second planar surfaces,

a plurality of electrical connectors extending from said first surface of said part number printed circuit board,

a first orderly array of discrete conductive surfaces disposed upon said second planar surface of said part number printed circuit board,

electrically conductive means connecting each of said discrete conductive surfaces to a predetermined one of said plurality of electrical connectors;

a space transformer structure having a first planar member and a second planar member in parallel spaced relationship to said first planar member,

said second planar member having an inwardly disposed and an outwardly disposed surface,

a plurality of electrical contacts contained within and extending through said first planar member and providing a second orderly array of discrete conductive areas respectively in physical contact with the conductive surfaces of said first orderly array of discrete conductive surfaces,

a densely spaced pattern of conductive lands contained on said outwardly disposed surface of said second planar member,

circuit means electrically connecting predetermined ones of said densely spaced conductive lands to predetermined ones of said electrical contacts contained within said first planar members; and

probe assembly means having a plurality of discrete electrical probes for connecting each of said densely spaced conductive lands to predetermined ones of said array of

conductive pads disposed on said substantially planar surface of said device under test.

3,963,987
METHOD AND APPARATUS FOR DIGITAL CALCULATION OF ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE

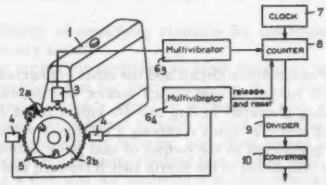
Jean-Pierre Rivere, Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of, France

Continuation-in-part of Ser. No. 463,503, April 24, 1974, abandoned, which is a continuation of Ser. No. 261,974, June 12, 1972, abandoned. This application June 26, 1974, Ser. No. 483,313

Claims priority, application France, June 14, 1971, 71.21514

Int. Cl.² G01P *3/48, 3/54*

U.S. Cl. 324—166 **11 Claims**



1. A digital method for calculating the speed of an internal combustion engine, using electric pulses produced with revolving parts of the engine, the revolving parts each having a series of detection elements, comprising the steps of producing a number of asynchronous pulses using a plurality of pickups, one of said pickups associated with a series of said detection elements, one of said pickups corresponding to a first series of detection elements having teeth all equally spaced on the periphery of one revolving part and two of said pickups corresponding to a second series of unequally spaced detection elements on the periphery of another revolving part, said asynchronous pulses being different for each revolution of the engine for said one pickup and said two pickups, respectively, wherein said first series has more detection elements than said second series and if n is the number of detection elements of said first series giving the higher pulse frequency for a corresponding pickup due to engine revolution, and q is the total number of pickups associated with the second series, then angular location of said second series of detection elements is obtained to the nearest 360° /qn, shaping the asynchronous pulses, comparing said shaped pulses to a fixed clock reference frequency to count said shaped pulses, dividing the counted pulses and then converting the divided pulses into signal information for use in an automatic engine control device.

3,963,988
CIRCUIT ARRANGEMENT FOR SELECTING A DIVERSITY CHANNEL

Dieter Niethammer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 2, 1974, Ser. No. 528,725

Claims priority, application Germany, Dec. 6, 1973, 2360929

Int. Cl.² H04B *7/02*

U.S. Cl. 325—56 **5 Claims**

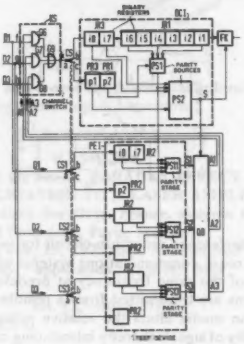
1. In a data transmission system, a circuit arrangement for selecting a diversity channel over which data is transmitted, wherein a channel switch and a code frame switch are provided for coupling received parity and information bits into, respectively, a parity bit register and an information bit register and wherein a number in parity bits are dependent on a number n of information bits, comprising:

a first parity stage having inputs connected to a number $m1$ cells of a first part of said parity bit register and to a number $n1$ cells of a first part of said information bit register,

a plurality of diversity channels,

code frame switch means connecting each said diversity channel to inputs of a second part of said parity bit register and to inputs of a second part of said information bit register,

a plurality of second parity stages, one of which is assigned to each said diversity channel,



means connecting $m2$ cells of said second part of said parity bit register, $n2$ cells of said second part of said information bit register and the output of said first parity stage to inputs of each of said second parity stages, the number m being equal to $m1 + m2$ and the number n being equal to $n1 + n2$,

channel switch means for selectively coupling said information bits and parity bits to one of said diversity channels and

quality evaluation means for producing control signals for operating said channel switch means in dependence on the relative quality of the diversity channels.

3,963,989
MIXER STAGE FOR MICROWAVE RECEIVERS

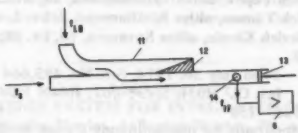
Florian Sellberg, and Peter Weissglas, both of Djursholm, Sweden, assignors to Institutet for Mikrovigsteknik, Stockholm, Sweden

Filed Apr. 18, 1974, Ser. No. 461,975

Claims priority, application Sweden, May 7, 1973, 7306344

Int. Cl.² H04B *1/26;* **H02M** *5/16*

U.S. Cl. 325—449 **6 Claims**



1. In a mixer for a microwave receiver and being responsive to a local oscillator signal and a received signal, the improvement comprising in combination:

a pair of coupled waveguides respectively having said local oscillator signal and said received signal applied thereto;

at least one barrier injection and transit time diode located in one of said pair of waveguides, said diode being oper-

ated in a non-oscillatory mode for mixing said local oscillator signal and said received signal to produce an intermediate frequency signal thereby; and

means connected to said diode for coupling said intermediate frequency signal from said diode.

3,963,990

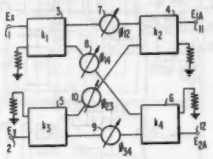
INTERFERENCE REDUCTION CIRCUIT

Daniel F. DiFonzo, Rockville, Md., assignor to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed Feb. 27, 1974, Ser. No. 446,459

Int. Cl.² H04B *15/00*

U.S. Cl. 325—476 **13 Claims**



1. An interference reduction circuit for use in a receiver of frequency reuse communications systems wherein a plurality of signals of the same frequency at predetermined different polarizations are transmitted from a remote location and the transmission media alters the relative polarizations between said plurality of signals thereby introducing cross-talk between the signals when they are received, said interference reduction circuit comprising:

a. a first plurality of hybrid coupling networks each receiving one of said transmission media altered signals and dividing each of said signals into a number of circuit paths equal in number to the number of received signals,

b. phase-shift means in each of said circuit paths for producing phase shifts in each of said signals, and

c. a second plurality of hybrid coupling networks each connected to one of said circuit paths from each of said first plurality of hybrid coupling networks after said phase-shift means for cross-coupling said circuit paths and thereby adding a sample of all other signals of equal amplitude, but opposite phase, to the cross-talk interference in each signal and thereby substantially cancelling the cross-talk interference in each signal to provide uncorrupted output signals at the outputs of said second plurality of hybrid coupling networks.

3,963,991

APPARATUS FOR DISCRIMINATING A PEAK LEVEL OF A VIDEO SIGNAL

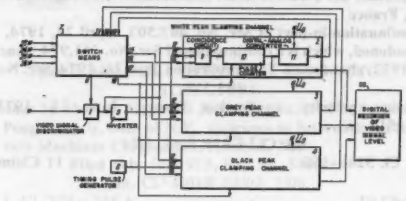
Imant Karlovich Alien, ulitsa Raunas, 45, kv. 32; Anatoly Vasilievich Nikonenko, ulitsa Lokomativas, 98, kv. 16; Jury Olegovich Popov, ulitsa Veidenbauma, 24, kv. 3; Boris Albertovich Yanson, ulitsa B. Altonovas, 9, kv. 1, and Arkady Yakovlevich Khesin, ulitsa Suvorova, 16, kv. 18, all of Riga, U.S.S.R.

Filed July 30, 1974, Ser. No. 493,664

Int. Cl.² H03K *5/13, 4/02;* **H04N** *5/04*

U.S. Cl. 328—150 **6 Claims**

1. An apparatus for discriminating a peak level of a video signal, comprising: a video signal discriminator with two inputs, a first being the video signal input, and an output; a switch means with four switch inputs and three switch outputs, the first switch input receiving frame synchronizing pulses, the second switch input receiving line synchronizing pulses, the third switch input being the input through which the apparatus is triggered, and the first of said switch outputs connected to the second input of said discriminator; a timing pulse generator; a plurality of video signal peak clamping channels each of which includes: a coincidence circuit with three inputs and an output, the first input of said coincidence circuit connected to the output of said discriminator, the second input thereof connected to the second switch output of said switch means, and the third input connected to said timing pulse generator; a pulse counter having two inputs, one connected to the output of said coincidence circuit and the other connected to the third switch output of said switch means, and an output; a digital-analog converter having two d/a inputs and a d/a output, one of said d/a inputs receiving a reference voltage and the other connected to the output of said pulse counter, the d/a output connected to the fourth switch input of said switch means.



3,963,992

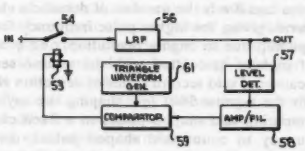
LINEAR AGC CIRCUIT WITH CONTROLLED DUTY CYCLE SAMPLING MEANS

Norris C. Hekimian, Rockville, Md., and James F. Turner, Oakton, Va., assignors to Hekimian Laboratories, Inc., Rockville, Md.

Division of Ser. No. 352,552, April 19, 1973, Pat. No. 3,862,380. This application Aug. 14, 1974, Ser. No. 497,483

Int. Cl.² H03G *3/00*

U.S. Cl. 330—127 **8 Claims**



1. A linear automatic gain control circuit, comprising:

an input terminal;

an output terminal;

sampling means, having a fixed sampling frequency and a voltage-controlled duty cycle, for passing discrete periodic samples of signals applied to said input terminal, said samples having said sampling frequency and the same duty cycle as said sampling means;

low pass filter means for receiving the signal passed by said sampling means and passing to said output terminal only frequency components of the received signal which are below said sampling frequency; and

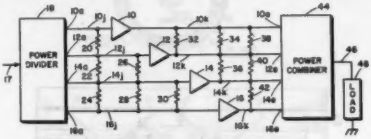
control means responsive to the level of signal passed by said low pass filter means for applying a corresponding control voltage to said sampling means to adjust the duty cycle at said sampling means.

3,963,993

POWER AMPLIFIER USING A PLURALITY OF PARALLEL CONNECTED AMPLIFIER ELEMENTS AND HAVING BURN-OUT PROTECTION

Garry R. Hoffman, Baltimore, and William P. Rinkers, Baltimore, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jan. 31, 1975, Ser. No. 546,153
Int. Cl.² H03F 3/68
U.S. Cl. 330—124 R 24 Claims



1. An amplifier for amplifying a frequency signal comprising:

a plurality of amplifying elements for amplifying said frequency signal;

input means for receiving an input frequency signal to be amplified and for distributing the signal power of said input frequency signal in accordance with a predetermined arrangement to each of said amplifying elements for amplification thereby, said input means being comprised of a plurality of input tranmission lines, each having a first end for receiving a predetermined portion of the signal power of said input frequency signal and a second end for delivering said predetermined portion of the signal power of said input frequency signal to an associated one of said amplifying elements, each of said input transmission lines having a different phase delay between its first and second ends to signals traversing therethrough;

at least one means for resistively connecting a first point of a first of said input transmission lines with a second point of a second of said input transmission lines, said first and second points being arranged such that the signals traversing said first and second of said input transmission lines are normally in phase and of equal amplitude at said first and second points; and,

output means connected to receive the output of each of said amplifying elements for effecting phase coherent addition of the signal outputs of said amplifying elements.

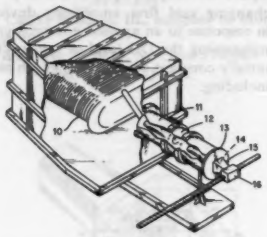
3,963,994

SLIT INJECTION DEVICE

Terry W. Alger; Leland G. Schlitt, and Laird P. Bradley, all of Livermore, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 15, 1975, Ser. No. 541,178
Int. Cl.² H01S 3/097
U.S. Cl. 331—94.5 PE 3 Claims

1. In an electron beam-excited laser system comprising an elongated laser cavity containing a gaseous lasing medium and having a foil window therein through which a beam from an electron beam source passes transversely to excite the lasing medium; the improvement comprising: a beam injection device positioned intermediate said laser cavity and said electron beam source for passing a suitably shaped electron beam through said foil window into said cavity and for varying the current density of the injected electron beam, said injection device being composed of a member positioned closely adjacent the foil window and functioning as a support structure for said foil window, said member being provided with a single elongated slit therethrough substantially parallel to a longitudinal axis of the laser cavity, and a plurality of movably mounted plate means positioned adjacent said member on a side thereof opposite from the foil window and defining an elongated aperture substantially parallel to said elongated slit



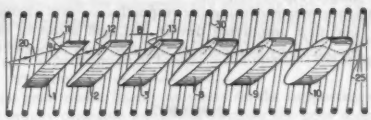
in said member, and means for moving said plurality of plate means for varying said elongated aperture.

3,963,995

NON-RETURN OPTICAL FARADAY EFFECT SYSTEM AND APPLICATION TO A LASER AMPLIFIER

Louis Jacob, Bretigny-Sur-Orge, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Feb. 25, 1975, Ser. No. 552,900
Claims priority, application France, Mar. 12, 1974, 74.08356
Int. Cl.² H01S 3/10
U.S. Cl. 331—94.5 C 2 Claims



1. In a non-return optical system, comprising: a number of plates having parallel faces made of a material having a Verdet constant, and means for setting up a magnetic field crossing the faces of these plates with a first plate directed, in relation to a laser beam, such that the angle of incidence be close to the Brewster angle, the improvement wherein: the planes of the various other plates are set in directions such that, on the one hand, the angle of incidence of the laser beam received on each plate is close to the Brewster angle and that, on the other hand, the angle between the normal to the plane of that plate and the normal to the plane of the plate situated upstream thereof is equal to the angle of rotation of the vector of polarization of said laser beam in crossing said upstream plate owing to the Faraday effect, and wherein; the number of plates, the material of which they are made, their thickness and the value of the magnetic field is chosen such that the total rotation angle undergone by the laser beam polarization vector between the input of the system and the output is approximately 45°.

3,963,996

OSCILLATION SYSTEM FOR INTEGRATED CIRCUIT

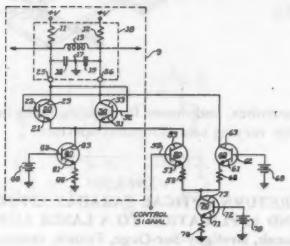
Peter Constantine Skerlos, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 5, 1974, Ser. No. 503,220
Int. Cl.² H03B 5/12
U.S. Cl. 331—117 R 8 Claims

1. A signal controllable variable frequency oscillation system, suitable for fabrication in an integrated circuit, producing oscillatory signals comprising:

an oscillator including a first amplifying device having a reactive impedance which varies as a function of said first

amplifying device conduction level, said reactive impedance determining the frequency of said oscillatory signal;
a load impedance coupled to said first amplifying device;
means changing said first amplifying device conduction level in response to an applied control signal;
means maintaining the DC level of said oscillatory signals substantially constant despite changes in said conduction level including:



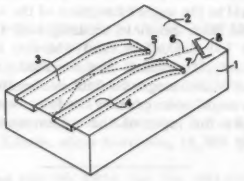
shunting means, coupled to said load impedance, providing a conductive path substantially paralleling said first amplifying device; and
balance means causing the respective current changes in said first amplifying device and said shunting means produced by said control signal to vary oppositely.

3,963,997

DEVICE FOR THE DIRECTIVE TRANSMISSION OF ELASTIC SURFACE WAVES AND PROCESS FOR MAKING THE SAME

Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 25, 1974, Ser. No. 518,218
Claims priority, application France, Oct. 30, 1973, 73.38638
Int. Cl.² H03H *9/26, 9/30;* **H01L** *41/18, 41/22*
U.S. Cl. 333—30 R **19 Claims**



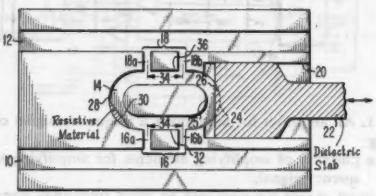
1. A device for the directive transmission of elastic surface waves, comprising: a crystalline substrate having a surface for propagating said elastic surface waves, and at least one directive zone formed in a portion of said substrate, said directive zone extending immediately below said surface; said directive zone having a permanently modified structure lacking to a substantially degree the regular arrangement of atoms of the lattice structure of the adjacent portions of said substrate, for causing a change in the phase velocity of said elastic surface waves within the extent of said directive zone.

3,963,998

VARIABLE BANDWIDTH TUNABLE DIRECTIONAL FILTER

Edwin William Richter, Acton, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 13, 1975, Ser. No. 558,002
Int. Cl.² H01P *1/20*
U.S. Cl. 333—73 W **8 Claims**



1. A variable bandwidth tunable directional filter for controlling and processing signals in data handling systems, comprising:
an input waveguide transmission line;
an output waveguide transmission line;
a ring resonator directionally coupled to said input and said output waveguides, said ring resonator being a waveguide formed to an annular ring within which an electromagnetic wave is propagated, the circumference of said resonator being an integral number of wavelengths, the resonant frequency of said resonator being tunable by adjusting the electrical length of the guided wave in said resonator, said directionally coupled ring resonator being capable of resonating with waves progressing in one direction, the frequency response at said resonance being characteristic of a band-pass filter;
a directional coupler to couple said ring resonator to said input waveguide;
a directional coupler to couple said ring resonator to said output waveguide;
dielectric means introduced into said resonator for adjusting the guided wavelength to tune said ring resonator; and
discrete attenuating means disposed within said ring resonator for attenuating said wave within said ring resonator for broadening the bandwidth of said directional filter and for decreasing the insertion loss of coupling said resonator to said waveguides to retain thereby a portion of said signal in said input transmission line to allow for additional coupling of other lines within said frequency bandwidth.

3,963,999

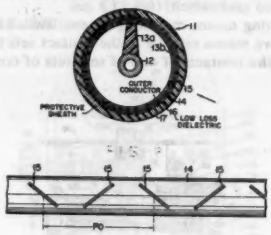
ULTRA-HIGH-FREQUENCY LEAKY COAXIAL CABLE

Iwao Nakajima, Ichihara; Takayoshi Maezawa, Tokyo, and Takeshi Fukazawa, Ichihara, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 29, 1975, Ser. No. 581,872
Int. Cl.² H01P *3/06;* **H01Q** *13/10*
U.S. Cl. 333—84 L **6 Claims**

1. An ultra-high-frequency leaky coaxial cable comprising an inner conductor, an insulator disposed on the inner conductor, an outer conductor provided on the insulator in a coaxial relation to the inner conductor and having a plurality

of slots formed at a predetermined pitch, and a protective sheath adapted to cover the outer conductor, characterized in



that a dielectric layer with an electrically low loss is disposed between the outer conductor and the protective sheath.

3,964,000

PUSHBUTTON DEVICE FOR MECHANICAL PRESELECTION TUNING

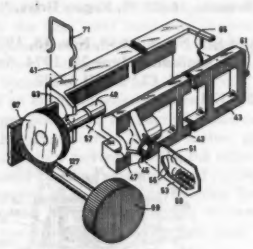
Lucas Wilhelmus Martinus Schijven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, Briarcliff Manor, N.Y.

Filed Jan. 7, 1975, Ser. No. 539,118

Claims priority, application Netherlands, Feb. 1, 1974, 7401404

Int. Cl.² H03J *5/06, 5/08, 5/32*

U.S. Cl. 334—7 **4 Claims**



1. A pushbutton device for mechanical preselection tuning in radio receivers, comprising a frame, an adjusting member having a longitudinal axis, means for mounting said member for rotation in said frame about said axis, means for coupling to receiver tuning means responsive to the angular position of said adjusting member, first means for rotating said member in response to a tuning control, said first means comprising a slip clutch, and second means for rotating said member to a selected one of a number of preselected positions responsive to pushbutton operation,

wherein said adjusting member and said slip clutch form portions of an elongated unit having two ends, said unit being rotatably journalled in said frame near said two ends, said slip clutch coupling between one of said ends and said adjusting member, such that upon rotation of said member by said second means only one journalled end of said unit rotates.

3,964,001

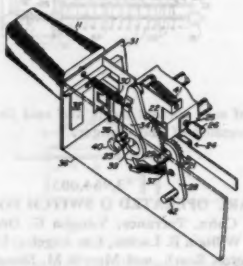
ANTI BACKLASH AND TREADLE BAR LINKAGE SYSTEM

Alfred James Clark, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1975, Ser. No. 574,064

Int. Cl.² H03J *5/32*

U.S. Cl. 334—7 **9 Claims**



1. A pushbutton type tuner assembly for a radio receiver, the assembly having a supportive structure, a plurality of tuning coils, a plurality of tuning cores, each one of the cores being movable longitudinally within one of the coils, a reciprocatingly movable carriage for holding the cores, and tuning means for predetermining specific positions of the cores within the coils for automatically selecting one of the predetermined positions of the cores and for manually selecting any desired position of the cores, the tuning means comprising:

a gear supporting shaft rotatably mounted on the supportive structure;

first gear means fixedly mounted on the supporting shaft;

manually operable means for rotating the gear supporting shaft;

actuating means rotatably mounted on the supportive structure for moving the core carriage;

second gear means integral with the actuating means and positioned to coact with the first gear means;

first lever means pivotably mounted on the supportive structure and positioned to apply a moment to the gear supporting shaft;

second lever means pivotably mounted on the supportive structure and positioned to apply a moment to the supporting shaft of the actuating means, thereby causing the first gear to mesh with the second gear;

first spring means for biasing the first lever means toward the second lever means;

second spring means connected to the second lever means for biasing the second lever means toward the first lever means.

3,964,002

PUSH-BUTTON T.V. TUNER

Emmanuel Eugene, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

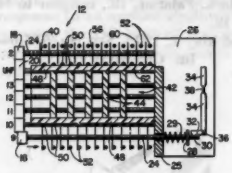
Filed July 14, 1975, Ser. No. 595,712

Int. Cl.² H03J *5/08*

U.S. Cl. 334—7 **3 Claims**

1. A push button multi-channel tuner module for a signal receiver comprising an elongated core containing electrical components, a plurality of longitudinally directed contact strips spaced around the periphery of said core, said strips being electrically connected to said components in a manner that each contact strip is associated with a different channel, fixed contact means positioned about said core and adapted to be connected to said receiver, a plurality of longitudinally directed channel selector plungers spaced around said core along said contact strips, said plungers passing along said fixed

contact means, and translatable contact means carried by each plunger for electrically bridging between a correspond-



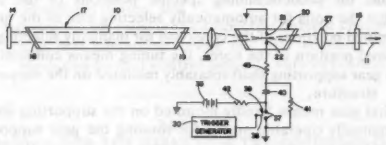
ing one of said contact strips and said fixed contact means upon depression of said plunger.

3,964,003

ARC OPERATED Q SWITCH FOR LASER

David B. Cohn, Torrance; Vaughn G. Draggoo, Huntington Beach; William B. Lacina, Los Angeles; Laurence E. Brown, Huntington Beach, and Merrill M. Stone, Rolling Hills Estates, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 26, 1975, Ser. No. 553,270
Int. Cl.[2] H01S 3/11
U.S. Cl. 331—94.5 Q 8 Claims



1. In a laser having a lasing medium, a pair of mirrors positioned on opposite sides of said lasing medium for effecting the oscillation of a light beam through said medium, means for switching the laser beam in response to a trigger signal comprising:

a pair of electrodes positioned opposite each other between said mirrors;

means for focusing said beam so as to pass between said electrodes; and

means for generating an arc between said electrodes in response to said trigger signal whereby material from at least one of said electrodes is ablated to form a metallic vapor spot, said vapor spot interrupting the path of at least a portion of said beam, said beam output being switched off while said metal vapor spot is present.

3,964,004

THERMOSTATIC SWITCH WITH STANDBY CONTACTS

Charles S. Mertler, 1012 Briarwood Road, Mansfield, Ohio 44907

Continuation-in-part of Ser. No. 445,778, Feb. 25, 1974, Pat. No. 3,913,048. This application June 19, 1975, Ser. No. 588,496
Int. Cl.[2] H01H 71/16
U.S. Cl. 337—67 31 Claims

1. A thermostatic switch comprising, in combination,

a base,

at least first, second, and third contacts,

said first and second contacts constituting a first set of contacts,

said third contact and another contact constituting a second set of contacts,

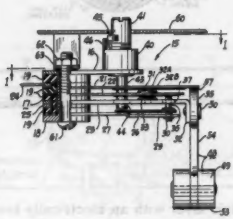
at least first and second electrical terminals,

conductive means forming a series electrical circuit from said first terminal through said first and second sets of contacts to said second terminal,

temperature responsive means movable with changes of temperature,

attitude responsive means movable with changes of attitude relative to said switch,

first mounting means mounting on said switch one of said responsive means relative to the contact sets to relatively actuate the contacts of one of said sets of contacts,



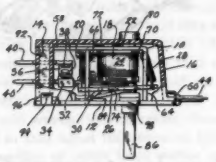
and second mounting means mounting on said switch the other of said responsive means relative to the contact sets to relatively actuate the contacts of said first contact set to an open condition and to relatively actuate on a standby basis the contacts of said second contact set in a direction toward an open condition upon failure of said first contact set to be actuated to an open condition, the opening of either contact set opening the series electrical circuit in the switch.

3,964,005

ELECTRO-MAGNETIC ASSEMBLY

Spencer C. Schantz, 16608 W. Rogers Drive, New Berlin, Wis. 53151

Division of Ser. No. 306,638, Nov. 15, 1972, Pat. No. 3,824,329. This application June 28, 1974, Ser. No. 484,203
Int. Cl.[2] H01H 67/02
U.S. Cl. 335—124 9 Claims

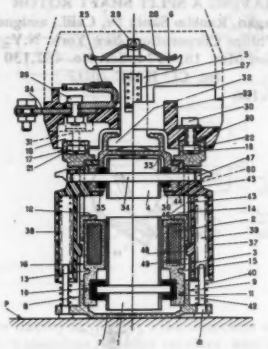


1. In an electromagnetic device having a ferromagnetic frame, having a ferromagnetic core mounted on said frame, having an electrical coil wound on said core, having a ferromagnetic armature pivoted to said frame adjacent to said core for movement toward and away from the end thereof, a base plate, a terminal strip mounted on and projecting from said base plate at right angles thereto, first legs projecting from said frame, means between said legs and terminal strip connecting said legs thereto, and second legs projecting at right angles from said frame and engaged with said base plate, said first legs being in the condition of being elastically formed to absorb tolerances between the frame, base plate, and terminal strip.

3,964,006
ELECTRICAL APPARATUS

Guy Lacan, Carrieres-sous-Bois, France, assignor to La Telemecanique Electrique, France

Filed Dec. 26, 1974, Ser. No. 536,570
Claims priority, application France, Jan. 3, 1974, 74.00159
Int. Cl.² H01H 50/04
U.S. Cl. 335—132 5 Claims



1. An electrical commutation apparatus comprising:

i. a frame having two substantially plane parallel wings and a base at one extremity of each of said wings, each of said wings having at its other extremity remote from said base one component of a respective first coupling assembly extending parallel to the base, at least one of said wings including a guiding opening extending normal to said base;

ii. a plurality of contact assemblies each comprising an insulating support containing at least one fixed contact and a carrier with a movable contact, said carrier having one component of a second coupling assembly extending parallel to the base, said insulating support having the other component of each of said first coupling assemblies;

iii. an assembly of a magnetic core and an associated energising coil secured in said frame and serving as the fixed portion of an electromagnetic motor;

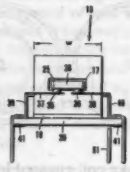
iv. an armature positioned to coact with said core and constituting the other portion of said motor, said armature being secured to a carriage having the other component of said second coupling assembly, said carriage including means engaged in said guiding opening for movement therein normal to said base during movement of said armature towards and away from said base.

3,964,007
NOISELESS AUTOMOTIVE RELAY

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 3, 1975, Ser. No. 564,588
Int. Cl.² H01H 3/00
U.S. Cl. 335—187 6 Claims

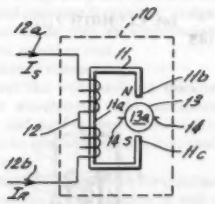
1. A sliding contact relay comprising: an insulate coil form part having an axial bore of rectangular section extending therethrough; a coil mounted on said coil form part; a stationary core formed of magnetizable material substantially enclosing said coil and said coil form part; a rigid insulate base; means fastening said stationary core part to said base; openings in said stationary core in registry with the bore in said coil form part; an armature member having a cross section corresponding to the cross section of said bore and slidably seated therein; said armature including a magnetizable movable core part defining a portion of said armature and having a length not greater than the length of said bore and an insulate bar portion defining the remainder of said armature member and having a head portion of a larger corss sectional area than the cross section of said bore, said head portion having an insulate fixed contact engaging surface and said bar having secured thereto an electrically conductive metal contact bar having a contacting surface which lies coplanar with the undersurface of said head portion and is located on said insulate bar portion between said head portion and said movable core part of said armature; two spaced apart fixed electrical contacts including means for supporting same for engagement with said contact engaging surfaces responsive to energization or deenergization of said coil; and spring means normally biasing said armature to a position wherein the contacting surface of said head portion of said insulate bar portion contacts said fixed contacts and a portion of the movable core part of said armature projects out of one end of said bore.



3,964,008
TARGET RESET MECHANISM

Lee A. Davis, Audubon, N.J., assignor to ITE Imperial Corporation, Spring House, Pa.

Filed Feb. 3, 1975, Ser. No. 546,626
Int. Cl.² H01H 85/38
U.S. Cl. 335—272 4 Claims



1. A combination comprising:

an indicator device, including a target disc having a first and a second surface and a magnetic yoke having a magnetization winding wound thereon; said target disc being magnetically actuated by said yoke to visibly present said first surface responsive to a first pulse of current flowing through said yoke winding in a first direction; said target disc being magnetically actuated by said yoke to visibly present said second surface responsive to a second pulse of current flowing through said coil winding in a second direction; and

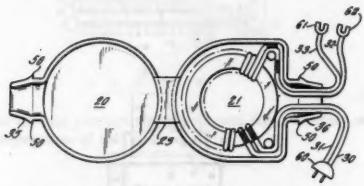
external means for selectably inducing a magnetic flux in said yoke when said external means is closely positioned thereto, whereby said target disc is magnetically actuated and one of said first and said second surfaces is caused to be visibly presented.

3,964,009

AC RADIATION CHOKE INSULATOR

Elliot Bernstein, Rockville Center, N.Y., and Richard Rosenberg, Paramus, N.J., assignors to Bel Fuse Inc., Jersey City, N.J.

Filed Nov. 3, 1975, Ser. No. 628,327
Int. Cl.² H01F 27/02
U.S. Cl. 336—90 3 Claims



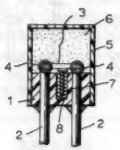
1. In a toroidal choke coil encased in a metal container; an opening in the container; said coil having leads; said leads extending through said opening in the container; the improvement comprising:
an insulating receptacle receiving said toroidal choke coil,
said insulating receptacle comprising two sections enclosing said coil;
said sections of said insulating receptable encasing and positioning said coil between them;
said combined sections fitting within said metal container;
each section of said insulating receptacle being provided with a part tubular extension; said part tubular extensions of each said sections combining to form a tubular member;
said leads extending through said tubular member, said tubular member extendng through said opening in said metal container.

3,964,010

SIMPLE, SMALL-SIZED FUSE

Okazaki Tasuku, 353-81, Nishi 3-chome, Nakayama-cho, Nara, Japan

Filed Oct. 8, 1974, Ser. No. 513,165
Claims priority, application Japan, Mar. 16, 1974, 49-30726
Int. Cl.² H01H 71/20
U.S. Cl. 337—148 3 Claims



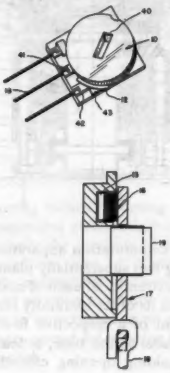
1. A fuse comprising:
a casing frame having one open side;
a heat resistant and insulative support base fitted into said open side;
a plurality of parallel lead wires fitted through said support base and held thereby in a stationary position with one end of each wire inside said casing and one end exposed outside of said casing;
conductive bridging means between said parallel wires for conductively connecting said lead wires to each other;
low temperature fusing means at the connecting points of said bridging means and said lead wires for fusibly joining said bridging means to said wires;
heat resistive biasing means fitted into said support base and biased against said bridging means for urging said bridging means away from said wires when said low temperature fusing means is fused; and
an anti-oxidant insulative filler filling the open space within said casing and surrounding said bridging means, fusing and biasing means.

3,964,011

SINGLE TURN VARIABLE RESISTANCE DEVICE HAVING A SPLIT SHAFT ROTOR

Randall C. Ragan, Rancho Santa Fe, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,130
Int. Cl.² H01C 10/32
U.S. Cl. 338—166 2 Claims

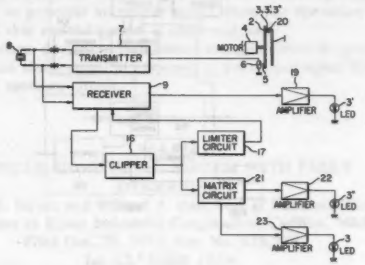


1. A single-turn variable resistance device comprising:
a substrate, having an opening therein, said substrate including a central collector ring and an arcuate resistance element;
terminal means on said substrate for connection to at least one end of the resistance element and the central collector ring;
a rotor having an integral split shaft extending therefrom, said shaft extending through said opening and journalled to rotate in said opening of said substrate;
means for separating the ends of the split shaft extending through the opening for enlarging the shaft and to rotatably secure said rotor to said substrate;
conductor leads affixed to said terminal means, at least the central conductor lead having a portion protruding above the surface of the substrate;
said rotor including a protrusion which will interfere with the portion of the conductor lead protruding above the surface of the substrate to act as a stop to prevent the rotor from exceeding 360° of travel;
each of the terminal means including a hole therethrough, the ends of each of the conductors being wrapped around the portion of the substrate extending from each hole to the end of the substrate;
said substrate also including a semi-hole at the end of the substrate below each terminal means hole to enable axial alignment of the main conductor portion;
said rotor including a recess in said rotor facing said resistance element; and
a resilient support inserted in said recess and a helical coil spring wiper also inserted in said recess and pressed against said resistance element and collector ring by the resilience of the support element and stored compressive force of the spring.

3,964,012
COLOR DISPLAY SYSTEM IN ULTRASONIC SONAR

Takeshi Yamamoto, and Keisuke Honda, both of Toyohashi, Japan, assignors to Keisuke Honda, Japan

Filed Aug. 6, 1974, Ser. No. 495,221
Claims priority, application Japan, Aug. 6, 1973, 48-88142
Int. Cl.² G01S 9/68, 7/56, 9/70
U.S. Cl. 340—3 C 10 Claims



1. A color display device for a fish detection sonar comprising a sonar transmitter, a sonar receiver, and a sonar transducer, said display device comprising

a. target intensity detecting means for detecting from the output of said receiver whether the target intensity of each target is higher or lower than one of a plurality of predetermined intensity levels, thereby detecting whether each target is within predetermined intensity level ranges,

b. a rotary disk driven by driving means in synchronism with the transmission of sound by said transducer,

c. a transparent, fixed scale disk with graduated scales disposed coaxially of and in opposed relation with said rotary disk, and

d. at least two display elements each capable of emitting light in a different color when energized and disposed upon said rotary disk in closely spaced apart relation,

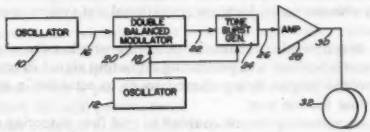
means electrically coupling said display elements to said target intensity detecting means for energizing each display element when the target intensity of each target is within an intensity level range assigned to said each display element,

whereby the targets may be displayed in different colors depending on the target intensity thereof.

3,964,013
CAVITATING PARAMETRIC UNDERWATER ACOUSTIC SOURCE

William L. Konrad, Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1974, Ser. No. 516,858
Int. Cl.² H04B 11/00; G01S 9/66
U.S. Cl. 340—5 R 5 Claims



1. A cavitating parametric underwater acoustic source for generating acoustic power efficiently in water which comprises:

a first oscillator means for generating electrical signals of a first output frequency;

a second oscillator means for generating electrical signals of a second output frequency;

a modulator means having inputs from the output of said first oscillator means and from the output of said second oscillator means and for having an output thereof with electrical signals having frequencies equal to the sum and difference of said first output frequency and said second output frequency and eliminating said first and second output frequencies in the output thereof;

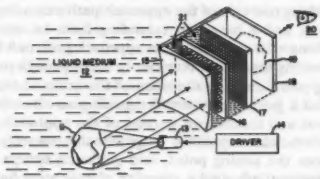
a toneburst generator means having the output of said modulator means to be an input thereof and for having an output comprising electrical signals of frequencies equal to the sum and difference of said first output frequency and said second output frequency; and

a transducer means for producing cavitation near the surface of said transducer means and generating electrical signals having a frequency equal to the difference of said first output frequency and said second output frequency efficiently in the water resulting from non-linearity caused by cavitation.

3,964,014
SONIC TRANSDUCER ARRAY

Stephen W. Tehon, Clay, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,617
Int. Cl.² H04R 1/44, 17/00
U.S. Cl. 340—9 10 Claims



1. A sonic transducer array for use in a liquid medium comprising:

a. a plurality of elongated piezoelectric transducers of substantially equal resonant frequency, designed to vibrate in a longitudinal mode with an intermediate nodal region and antinodes at either end,

b. supporting means comprising:

1. a thin sheet-like web having a thickness of less than one-eighth wavelength; said transducers being supported by said web at their nodal regions in a position orthogonal to said web, spaced over said web at regular intervals; and

2. a frame attached to said web for mechanically supporting said transducers in position in said liquid medium,

c. means for coupling the antinodal regions of the transducers on one face of said array to said liquid medium for mechanical interaction therewith, and

d. electrode means coupled to said transducers for electrical interaction therewith.

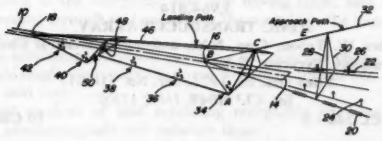
3,964,015
AIRCRAFT APPROACH AND LANDING LIGHT SYSTEM

William O. Collins, 6258 N. Kensington St., McLean, Va. 22101

Filed Feb. 21, 1974, Ser. No. 444,353
Int. Cl.² G08G 5/00
U.S. Cl. 340—26 2 Claims

1. A visual approach guidance system for guiding an aircraft toward an aiming point on a runway comprising a plurality of indicating light units spaced equally on each side of the correct approach path for the aircraft with the light units converging toward the aiming point, each of the light units includ-

ing at least two light members oriented in laterally and vertically spaced relation with the inner light members being above the outer light members, the outer light members being in the form of a longitudinal light bar and the inner light members being a dot-type light for direct viewing of the bars from the approach path as closely spaced solid line segments in longitudinal alignment and converging toward the aiming point and direct viewing of the dot-type lights from the approach path as being in alignment with the bars, a vertical plane including the dot-type lights in a pair of light units disposed in transversely aligned relation on opposite sides of the correct approach path for the aircraft and being defined by a base line extending between the outer light members and sides extending from the outer light members through the dot-type light members having its apex coinciding with the approach path of an aircraft whereby the pilot of an aircraft following the approach path will observe two converging segmental lines of light with the dot-type lights being aligned with the light bars, an inclined triangular plane surface being defined by the approach path extending to the aiming point, the outer light



members along one side of the approach path extending to the aiming point and a base line extending from an outer light member along said one side of the approach path and through a corresponding inner light member to the approach path with the aiming point defining the apex of the inclined triangular surface, and a guidance system for guiding an aircraft during the flare out and touchdown portion of the approach path in which the touchdown point is longitudinally inwardly on the runway from the aiming point, said guidance system for the flare out portion including a plurality of indicating light units spaced along the runway and converging toward the touchdown point, each indicating light unit in the guidance system for the flare out portion of the approach path including three elongated bars with two of said bars in longitudinal alignment with each other and the third bar disposed in spaced parallel relation thereto and centrally between said two of the bars for direct viewing of the bars themselves as closely spaced solid line segments in apparent longitudinal alignment with each other while following the flare out portion of the approach path toward the touchdown point.

3,964,016

RECORDING SYSTEM FOR VEHICLE OCCUPANT PROTECTING APPARATUS

Takashi Yamada, Anjo; Kazuo Oishi, Oobu; Toshiaki Kato, Nishio, and Kazuo Iwase, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 14, 1974, Ser. No. 451,293

Claims priority, application Japan, Mar. 16, 1973, 48-31101

Int. Cl.² B60R 21/08

U.S. Cl. 340—52 H **9 Claims**

1. A recording system for a vehicle occupant protecting apparatus comprising:

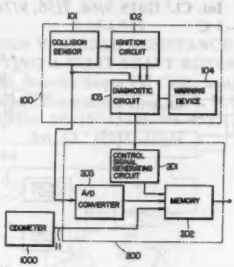
a collision sensor for detecting a collision of the vehicle to produce a collision signal;

an occupant protecting apparatus ignition circuit connected to said collision sensor for receiving said collision signal to actuate, in response thereto, said occupant protecting apparatus;

a diagnostic circuit connected to said collision sensor and said ignition circuit, said diagnostic circuit, being responsive to any of:

1. the occurrence of a fault in said collision sensor,
2. the occurrence of a fault in said ignition circuit, and
3. operation of said ignition circuit for actuating the occupant protecting apparatus, to produce a diagnostic signal;

driving condition indicating means for producing a signal indicative of a driving condition of said vehicle; and



a recording circuit connected to said collision sensor, the diagnostic circuit and said driving condition indicating means, said recording circuit being responsive to the occurrence of the diagnostic signal to record said signal indicative of the driving condition and any collision signal produced by said collision sensor.

3,964,017

TEST SYSTEM FOR SKID CONTROL APPARATUS

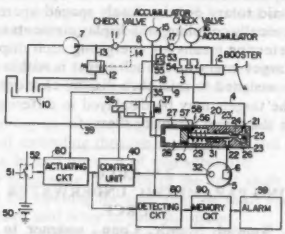
Hiroshi Arai, and Juichi Shibatani, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed July 24, 1974, Ser. No. 491,322

Claims priority, application Japan, Mar. 20, 1974, 49-30912

Int. Cl.² B60T 8/02

U.S. Cl. 340—52 C **36 Claims**



1. For a skid-control system having a hydraulic modulator adapted to modulate the hydraulic brake pressure from a master cylinder to a wheel cylinder in a vehicle having an engine, and means for actuating said hydraulic modulator when wheels start to lock, an operational test system, comprising:

A. first detecting means for detecting whether the engine is started or not and producing an output signal in response to the engine being started so as to establish a starting time for the test;

B. an actuating circuit coupled to said first detecting means to cause the hydraulic modulator actuating means to actuate the hydraulic modulator in response to the output signal from said first detecting means;

C. second detecting means coupled to said modulator for detecting the operation of said modulator and producing output signals indicative of the operation of the hydraulic modulator;

D. a detecting circuit coupled to said second detecting means and said actuating circuit for detecting whether the operation of said skid control system is normal or abnormal in response to the output signals from said second detecting means and said actuating circuit and producing signals indicative of normal or abnormal operation of said skid control system;

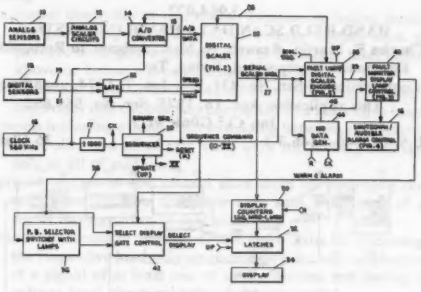
E. a memory circuit coupled to said detecting circuit to store therein the output signal from said detecting circuit and to generate an output signal when the operation of said skid control system is abnormal, and

F. an alarm device coupled to said memory circuit to generate an alarm signal in response to the output signal from said memory circuit.

3,964,018
VEHICLE MONITORING SYSTEM WITH FAULT OVERRIDE

Ronald E. Strait, and Willard A. Hall, both of Cadillac, Mich., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Oct. 29, 1974, Ser. No. 518,778
Int. Cl.² G08B 19/00
U.S. Cl. 340—52 F **24 Claims**



1. A monitor system for vehicle parameters comprising:

means for providing continuous parameter value information for a plurality of vehicle parameters;

sequencing means for providing a series of sequence commands defining a data sequence for each parameter during a scan interval;

scaler circuit means coupled to said providing means and to said sequencing means for providing serial scaled data during each scan interval;

means for storing preselected parameter limits;

correlating means coupled to said storage means and to said scaler circuit means for correlating data received from said scaler circuit means with corresponding parameter limits from said storage means and for providing an event occurred output signal if data from said scaler circuit means for a parameter reaches a predetermined stored limit for said parameter;

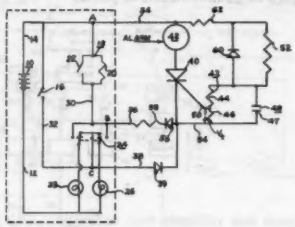
means coupled to said scaler circuit and means for selecting and displaying at least one parameter value; and

fault circuit means coupled to said correlating means and to said selecting and displaying means and responsive to said event occurred signal for overriding a parameter selected for display in the event a different parameter reaches its associated stored limit indicating a system fault by displaying the fault parameter.

3,964,019
TIMER

David A. Wethe, 1570 N. Coast Highway, Laguna Beach, Calif. 92651; Charles W. Behn, 1646 E. 14th St., Santa Ana, Calif. 92701, and Richard B. Willetts, 282 Forest Ave., Laguna Beach, Calif. 92651

Filed Dec. 19, 1973, Ser. No. 426,203
Int. Cl.² B60Q 1/34
U.S. Cl. 340—73 **6 Claims**



1. An electric circuit means useful for timing of the duration of a turn signal circuit of a vehicle having turn signal and brake lights energized by a battery through flasher and manual turn signal switches to generate an intermediate electrical potential and a brake switch which comprises:

first and second conductor means in circuit with said flasher for input of said intermittent electrical potential to said electrical circuit means;

an electronic switch circuit connected across said first and second conductor means and including alarm means and a silicon controlled rectifier having its electrodes in series connection with said alarm means and having a gate terminal;

a timer circuit to operate said electronic switch circuit comprising:

capacitive means in series with a first current limiting resistance means also connected between said first and second conductor means;

voltage divider means including resistance means in parallel connection to said capacitive means and connected across the terminals of said capacitive means;

connector means extending from the gate terminal of said silicon controlled rectifier to an intermediate position on said voltage divider means;

a holding circuit comprising diode means in series with second current limiting resistor means connected between said capacitive means and one side of said electronic switch means and operative to permit discharging current flow from said capacitive means through said electronic switch means during the off portions of the input intermittent potential whereby said electronic switch means is maintained in a conducting mode for a plurality of pulses of said input intermittent potential; and

conductor means connecting said brake switch in circuit with said capacitive means and including diode means to permit discharge of said capacitive means when said brake switch is closed.

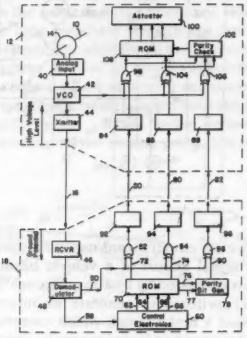
3,964,020
HIGH VOLTAGE SYSTEM WITH SELF-TEST CIRCUITRY

Arthur F. Dickerson, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 6, 1975, Ser. No. 556,074
Int. Cl.² G08C 25/00, 23/00; H04B 9/00, 17/00
U.S. Cl. 340—146./AG **6 Claims**

1. A high voltage system which automatically and continuously self-tests its communication links to check for malfunctions, comprising:

sensing means for sensing the value of electrical conditions in a high voltage line;
control electronics;
a communication link;
signal processing means for generating a voltage signal representing the value sensed by said sensing means, said signal being sent along said communication link to said control electronics and also as a digital clock;
fault correction means for compensating for faults in said system;
a plurality of communications paths;



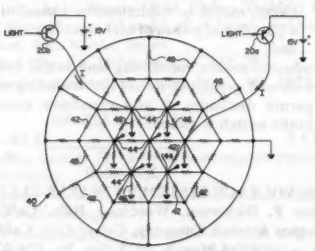
said control electronics for delivering control commands to said fault correction means via said plurality of communication paths having a first and second end;
clocked encoding means at said first end of said communication paths and clocked decoding means at said second end of said communication paths;
parity bit generator connected between said control electronics and one of said encoding means for producing an appropriate parity bit;
parity checking means connected between one of said decoding means and said fault correction means for comparing that the digital information going into said encoding means is the same information being outputted from said decoding means.

3,964,021

PREPROCESSING SYSTEM AND METHOD FOR PATTERN ENHANCEMENT

Ilan Tamches, Greenbelt, Md., assignor to Visionetics Limited Partnership, Riverdale, Md.

Filed July 27, 1973, Ser. No. 383,282
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 MA **36 Claims**



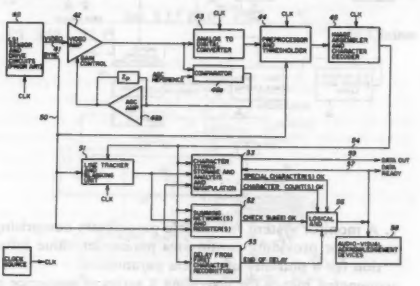
1. A method of preprocessing an optical pattern in a spatially-modulated scene to provide an enhanced pattern for use with an optical pattern recognition system and the like, comprising:
a. converting the light energy received from said scene into electrical signals proportional to the energy of the received light, and providing said signals at a plurality of first outputs in parallel;
b.
1. simultaneously receiving at a plurality of hexagonally disposed input nodes the signals provided at said parallel first outputs,
2. band-pass filtering said signals in the spatial domain for deriving further signals representative of an enhanced optical pattern with respect to the carrier in the spatially-modulated scene, and
3. providing said further signals at a plurality of hexagonally-disposed output nodes in parallel;
c. simultaneously peak detecting the further signals provided at said second output nodes by
1. selectively comparing the further signals at each of a plurality of pairs of adjacent output nodes with two signals at another pair of adjacent output nodes, each two pairs of output nodes in the hexagonal output pattern whose signals are compared being those for which imaginary lines connecting the two nodes in each pair are substantially perpendicular, and
2. providing a series of peak output signals whose locus defines line elements representative of an output pattern enhanced with respect to said input and derived immediately upon the receipt of light energy from said scene.

3,964,022

HAND-HELD SCAN DATA HANDLING SYSTEM

Charles E. Martin, Roswell, N. Mex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Continuation of Ser. No. 431,376, Jan. 7, 1974, abandoned.
This application Apr. 18, 1975, Ser. No. 569,692
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 J **36 Claims**



1. A method for optically reading and automatically processing alphanumeric data utilizing a hand-held wand, which comprises the steps of:
passing a two-dimensional array of photosensitive elements horizontally along a line of data to be read,
focusing an optical image of the data upon said array,
digitizing the output signals produced by said array,
thresholding said digitized outputs to produce a 1 bit binary code indicating black data cells and white data cells,
storing said binary codes in registers to form a plurality of character images,
shifting the binary codes in the register to simulate vertical movement of said array relative to the line,
combining the binary codes indicating black cells the binary codes indicating white cells to provide an identification of the presence of a character image along the line, and
processing the character images for character recognition at intervals related to the time required for movement of the array a preset distance along the line for each simulated increment of vertical movement.

3,964,023

METHOD OF AND APPARATUS FOR SELECTIVELY CONTROLLING A PLURALITY OF REMOTELY LOCATED LOADS

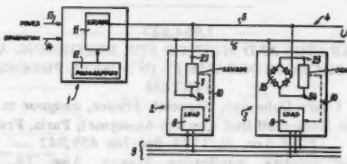
Jean-Jacques Fauchez, Saint-Egreve, France, assignor to Anvar, Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Feb. 19, 1975, Ser. No. 551,051

Claims priority, application France, Feb. 20, 1974, 74.06553

Int. Cl.² H04Q 9/00

U.S. Cl. 340—147 PC **11 Claims**



1. A system for operating a plurality of variously remotely located loads from a single master location, said system comprising:

a master controller at said master location including means for generating a succession of voltage signals each of positive or negative polarity and of a voltage level either above or below a predetermined threshold;

at least four slave units connected in parallel to said master controller and each at and connected to a respective load;

means including a conductor extending between said master controller and all of said slave units for feeding said signals to all of said units;

priority means in one of said slave units for operating the respective load on reception over said conductor of a signal having either of said polarities;

handicap means in another of said slave units for operating the respective load only on reception over said conductor of a signal of at least one of said polarities and having a voltage level above said threshold;

negative-responsive means in yet another of said slave units for operating the respective load only on receptin over said conductor of a signal of negative polarity; and

positive-responsive means in yet another of said slave units for operating the respective load only on reception over said conductor of a signal of positive polarity.

3,964,024

TRANSPONDER FOR AN AUTOMATIC VEHICLE IDENTIFICATION SYSTEM

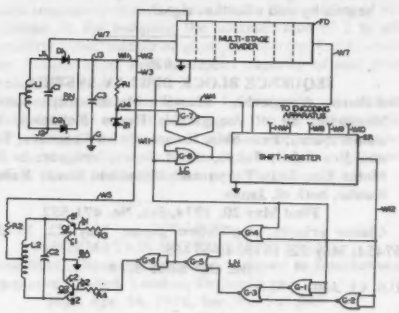
Thomas J. Hutton, and John W. Kramer, both of Pittsburgh, Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 15, 1974, Ser. No. 524,138

Int. Cl.² H04Q 9/00; G01S 9/56

U.S. Cl. 340—152 T **10 Claims**

1. A transponder for an automatic identification system comprising, a receiving coil tuned to the frequency of an interrogating signal, a rectifier for rectifying the interrogating signal to provide a source of d.c. operating potential for the transponder, a multi-stage divider for dividing the frequency of the interrogating signal into an *f/n* frequency signal wherein n is an integer, a logic circuit including a plurality of gates receiving said *f/n* frequency signal, an amplifier is supplied with said *f/n* frequency signal by said gates of said logic circuit for amplifying said *f/n* frequency signal, a shift register encoded with binary data, a latching circuit for enabling the shift register to transfer the encoded binary data to said logic circuit and in turn to said amplifier for phase modulating said *f/n* frequency signal in accordance with said binary data, and a



transmitting coil coupled to said amplifier and tuned to said *f/n* frequency signal.

3,964,025

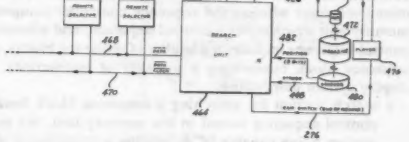
SOLID STATE SEARCH UNIT FOR AUTOMATIC PHONOGRAPH

Gerard J. Oosterhouse, Grand Rapids, Mich., assignor to Rowe International Inc., Whippany, N.J.

Filed Nov. 22, 1974, Ser. No. 526,098

Int. Cl.² G11B 19/08; G06F 11/00; H04Q 9/14

U.S. Cl. 340—162 **19 Claims**



1. In an automatic phonograph system in which selections are identified by respective multidigit selection identification numbers, apparatus including

a. user actuated selector means for generating a selection signal representing a desired selection,

b. display means responsive to a display signal corresponding to a particular selection for displaying the identification number of particular selection,

c. means for generating a position signal representing the selection in position for play, each of said selection, display, and position signals comprising a binary coded representation of a selected identification number,

d. a shift register capable of storing a signal representing the selection identification number,

e. transmitting means for cyclically loading the shift register with the position signal and then shifting the position signal out of said register and transmitting the same as a display signal to the display means,

f. receiving means responsive to the generation of a selection signal by the selector means for inhibiting said transmitting means and loading the selection signal into the shift register,

g. a memory having a plurality of normally blank locations corresponding to the number of selections offered, said locations adapted to be loaded with positive play signals to indicate that the corresponding selection is to be played, and

h. means responsive to the loading of a complete selection signal into the shift register for writing a play signal into the memory location corresponding to the number represented by said selection signal.

3,964,026

SEQUENCE BLOCK DISPLAY SYSTEM

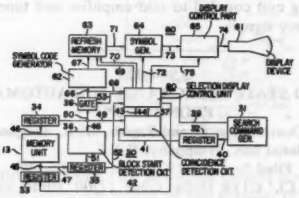
Nobuharu Yamauchi; Masaji Matsumura; Katsuhide Morimoto, all of Amagasaki; Haruo Koyanagi, Musashimurayama; Iwao Sato, Komae; Buhei Yasuhara, Tokyo , and Jiro Sakai, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Tokyo and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Filed May 20, 1974, Ser. No. 471,552

Claims priority, application Japan, May 22, 1973, 48-57454; May 22, 1973, 48-57455

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—172.5 4 Claims



1. A sequence block display system used with a sequence controller for controlling a controlled-objective in a predetermined sequence wherein the sequence controller comprises a memory unit which stores a control sequence, and wherein the control sequence includes a plurality of sequence blocks, each sequence block comprising a plurality of instructions, said display system comprising:

a search section for searching a sequence block from the control sequence stored in the memory unit, the search section being capable of generating a coincidence signal when coincidence is detected between the instruction read in succession from the memory unit and the instruction included in the sequence block to be retrieved;

a sequence block display section including a display device;

a memory for storing the instructions of a sequence block in a form suited for display;

a control unit which receives the coincidence signal from the search section and causes said memory to store, according to the coincidence signal, the instructions of the sequence block in a form suited for display, the control unit being capable of repeatedly reading the data in the memory and displaying them on the display device;

said search section comprising a first register to which the last instruction of a sequence block to be retrieved is given, a coincidence detection circuit which generates a coincidence signal when coincidence is detected between the instruction read from the memory unit and the instruction registered in the first register, and a second register which generates, when the coincidence signal is generated, a signal of the address in the memory unit where the first instruction of the searched sequence block is stored;

said control unit being capable of designating, according to the coincidence signal, the addresses in succession until the coincidence signal is generated again from the address in the second register, and causing the memory of the display section to store the instructions read for the period from the first coincidence signal to the next coincidence signal;

said display section comprising a symbol generator for converting the read output from the memory into a symbol pattern;

a display control part for controlling the display device according to said read output from the memory;

said display section being arranged to be capable of displaying the instructions of each sequence block in the form of a sequence diagram comprising control elements;

a state indicating circuit for adding additional data to the instructions of the sequence block which are stored in the memory of said display section;

said additional data comprising input and/or output signals to the sequence controller;

said display section displaying the states of said control elements according to said additional data.

3,964,027

APPARATUS AND METHOD FOR RECORDING AND USING MICROPROGRAMMES IN A DATA PROCESSING SYSTEM

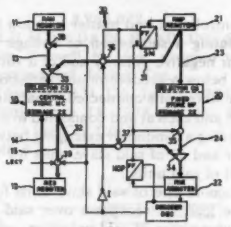
Ginette Laure Dalmasso, Bagnolet, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 10, 1974, Ser. No. 459,842

Claims priority, application France, Apr. 19, 1973, 73.14402

Int. Cl.[2] G06F *9/06*

U.S. Cl. 340—172.5 9 Claims



1. Apparatus for providing the function of a control store of a data processing system, comprising in combination:

a fixed store for holding microinstructions in respective locations thereof;

a central store of said data processing system for holding microinstructions in respective locations thereof;

each of said stores responding to an address received thereby which represents a respective location in said store for delivering at an output connection thereof the microinstruction held in said location;

the microinstructions held in said fixed store and said central store having a common format;

a first register for holding a store address;

first transfer means for transferring the address contents of said first register to said fixed store;

second transfer means; said second transfer means being controllable for transferring the address contents of said first register to said central store;

a second register for holding a microinstruction for controlling a respective operation to be carried out by said data processing system;

third transfer means, said third transfer means being controllable for transferring a microinstruction from said output connection of said fixed store to said second register;

fourth transfer means, said fourth transfer means being controllable for transferring a microinstruction from said output connection of said central store to said second register; and

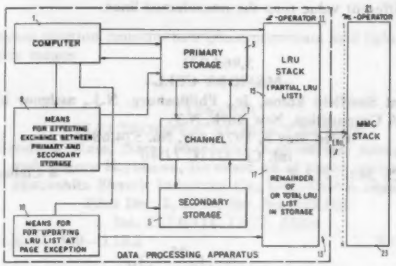
selectively operable switching means coupled to said first register and responsive to the contents thereof for operating in one of first and second states, said switching means

when operating in said first state controlling said third transfer means to enable transfer therethrough and when operating in said second state controlling said second and fourth transfer means to enable transfer therethrough.

3,964,028
SYSTEM AND METHOD FOR EVALUATING PAGING BEHAVIOR

Laszlo A. Belady, Yorktown Heights, N.Y., and Frank P. Palermo, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1973, Ser. No. 385,223
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **5 Claims**



1. A system for use in data processing apparatus which is operated as a paging machine and wherein program is considered as a page reference string, for determining the minimum memory capacities of the pages of said string, said data processing apparatus including means for maintaining a first list of the names of the pages of said program ordered in accordance with a least recently used (LRU) criterion, said first list being constituted by the names of said pages and least recently used (LRU) integers respectively having one of the different discrete values of 1 to n, respectively, associated with each of said names according to said criterion, wherein n is equal to the total number of said pages in said program, said system comprising:

means for maintaining a second list of said names, said second list being constituted by an ordered sequence of 1st to nth addresses, there being located at each of said addresses a different integer, C, from which the minumum memory capacity (MMC) of a page can be determined, each of said integers, C, of said second list having a different discrete value of 1 to n;

means responsive to said means for maintaining said second list for determining said minimum memory capacity of a given referenced page comprising;

means responsive to the referencing of said given page for dividing said second list into a first group of addresses having the values of 1 to (l1), respectively, and a second group of addresses having the values of 1 to n, respectively, wherein 1 is equal to the LRU integer associated with said given referenced page;

means responsive to said means for dividing of said second list for determining the address, k, in said second group having the lowest value integer, C, in said second group,

means responsive to said means for determining said address, k, for marking the series of addresses in said second group included in the subgroup containing the addresses l, $(l+1)$, . . . , $(k-1)$, which have the following values, viz. l, $(l+a)$, $(l+b)$, $(l+c)$, . . . , up to address $(k-1)$, if necessary, wherein $(l+a)$ has the smallest address value greater than l such that $C(l+a) < C(l)$, wherein $(l+b)$ has the smallest address value greater than $(l+a)$ such that $C(l+a)$, etc., wherein $C(i)$ is the integer, C, at address ,

means responsive to said means for dividing said second list for incrementing each of the addresses $2 - (l-1)$ in said first group by 1 to constitute the addresses 3 to l,

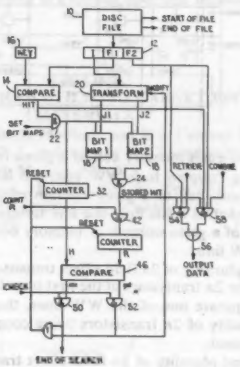
means responsive to said means for the determining of said address, k, for assigning the address value of 2 to said smallest MMC integer originally at address, k, said smallest integer being said minumum capacity of said given referenced page, and

means responsive to said means for assigning said address value of 2 for respectively assigning to each of the series of said marked addresses of said second group, the value of the next address in said series, the highest value address in said series being assigned the value of k.

3,964,029
INFORMATION RETRIEVAL SYSTEMS

Edward Babb, Stevenage, England, assignor to International Computers Limited, London, England

Filed Apr. 14, 1975, Ser. No. 567,643
Claims priority, application United Kingdom, June 19, 1974, 27093/74
Int. Cl.² G06F *1/00*
U.S. Cl. 340—172.5 **8 Claims**



1. An information retrieval system comprising: a file store holding a plurality of records each having an index which identifies that record, a plurality of storage areas each having a plurality of individually addressable bit locations, the total number of such locations being smaller than the number of records in the file; means for operating on an index in a plurality of different ways to produce a plurality of addresses, one for each storage area; means for searching the file to compare each record with a search criterion and to produce a hit indication whenever a record is found which satisfies the search criterion; means responsive to a hit indication to write a predetermined pattern of bits into the addressed locations of the storage areas; and means for reading out the contents of the addressed bit locations of the storage areas to produce a stored hit indication in the event that those locations contain the predetermined pattern of bits.

3,964,030
SEMICONDUCTOR MEMORY ARRAY

James Teh-Zen Koo, Wescosville, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 423,295, Dec. 10, 1973, abandoned.
This application Oct. 29, 1974, Ser. No. 518,636
Int. Cl.² G11C *13/00*, *11/40*
U.S. Cl. 340—173 R **8 Claims**

1. A semiconductor memory system comprising:

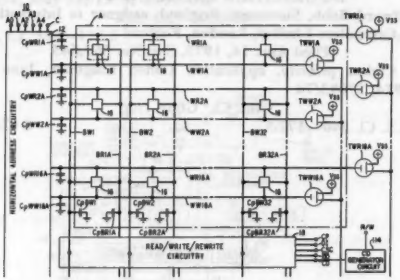
a first array of n-rows and m-columns of interconnected memory cells;

a second array of n-rows and m-columns of interconnected memory cells;

each of the memory cells comprises three field effect transistors, the drain of the first transistor being coupled to the gate of the second transistor, the drain of the second transistor being coupled to the source of the third transistor;

a WR, WW, BR, and BW terminal being coupled to the gate of the third transistor, the gate of the first transistor, the drain of the third transistor, and the source of the first transistor, respectively;

the WR terminal of each memory cell of a given row of memory cells being coupled to a WR line, the WW terminal of each memory cell of a given row of memory cells being coupled to a WW line, the BR terminal of each memory cell of a given column of memory cells being coupled to a BR line, the BW terminal of each memory cell of a given column of memory cells being coupled to a BW line;



a first plurality of $2n$ field effect transistors, the gate of each of the $2n$ transistors of the first plurality being coupled to a separate one of the WW lines, the drains of the first plurality of $2n$ transistors being coupled together to a y terminal;

a second plurality of $2n$ field effect transistors, the gate of each of the $2n$ transistors of the second plurality being coupled to a separate one of the WR lines, the drains of the second plurality of $2n$ transistors being coupled together to a terminal X;

the drain of a transistor TLX being coupled to terminal X;

the drain of a transistor TLY being coupled to terminal Y;

a plurality of first capacitors, a separate one of each of the first capacitors being coupled to a WW line;

plurality of second capacitors, a separate one of each of the second capacitors being coupled to a WR line;

a plurality of third capacitors, a separate one of each of the third capacitors being coupled to a BW line;

a plurality of fourth capacitors, a separate one of each of the fourth capacitors being coupled to a BR line;

all WR lines and WW lines being coupled to horizontal address circuitry which is adapted to select a WW and WR coupled to the same row of transistors of the first or second array and set the potential ofthe selected WR and WW to a different value than all other WRs and WWs;

read/write/rewrite circuitry comprising:

m-subcircuits, each of the m-subcircuits comprising four circuits *m*1, *m*2, *m*3, and *m*4, circuit *m*1 comprising:

first, second, third and fourth transistors T1A, T2A, T3A, and T4A, the gate of T1A and the drains of the T3 and T4 being coupled to a separate one of the BR lines of array A, the drain of T1 being coupled to the source of T2, the drain of T2 being coupled a separate one of the BW lines, circuit *m*2 comprising first, second, third and fourth transistors, T1B, T2B, T3B, and T4B, the gate of T1B and the drains of T3A and T4A being coupled to a separate one of the BR lines of array B;

*m*3 comprising a single transistor, the source of which is coupled to a separate one of the BW lines;

*m*4 comprising four transistors, T11, T12, T13, and T14, the gates of T11 and T14 being coupled together to a separate one of *m*-date select lines, the drain of T11 being coupled to a $\overline{DO}$ line, the source of T14 being coupled to a $\overline{DI}$ lines, the source of T11 being coupled to the drain of T12, the gate of T12 being coupled to a separate one of the BW lines and to the drain of T13, the source of T13 being coupled to the drain of T14;

the drain of a transistor TD1 being coupled to line $\overline{DI}$, and the source of a transistor $\overline{TDO}$ being coupled to line $\overline{DO}$;

the *m*-data select lines being coupled to vertical address circuitry which is adapted to select one of the data selected lines and set the potential of the selected line at a different value than the nonselected lines.

3,964,031

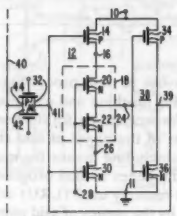
MEMORY CELL

Sargent Sheffield Eaton, Jr., Phillipsburg, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 5, 1975, Ser. No. 574,686

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **8 Claims**



1. A memory cell comprising, in combination:

first and second inverters, each having an input node and an output node, each coupled at its output node to the input node of the other;

a digit line;

means responsive to a read command for coupling said digit line to the input node of the first of said inverters; and

means responsive to a strobe signal concurrent with said read command for disconnecting the input node of the second of said inverters from the first of said inverters.

3,964,032

OPTICAL SYSTEM FOR STORING INFORMATION

Andrew M. Bardos, Indian Harbour Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

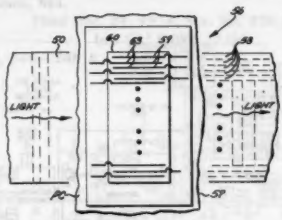
Division of Ser. No. 452,071, March 18, 1974. This application Nov. 27, 1974, Ser. No. 527,618

Int. Cl.² G11C *13/04, 11/44*

U.S. Cl. 340—173 LM **24 Claims**

1. An information storage system comprising a light transmissive member on which a record of information is spatially distributed, means for directing a light beam onto said member, said member having a thickness longitudinally of said beam that varies across a transverse dimension of said beam so that said member prismatically deflects said beam upon transmission thereof, means for sensing said deflection including light sensistive means for detecting the position of the output beam after said prismatic deflection and for producing a position signal responsive to said output beam position, and means for receiving said light beam and responsive to said

signal for compensatorily deflecting said beam to substantially correct for said prismatic deflection and maintain said output



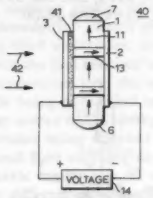
beam position constant at a place proximate said light sensitive means.

3,964,033

ELECTROOPTIC STORAGE DEVICE

Kiyotaka Wasa, Nara; Shunichiro Kawashima, Amagasaki, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 2, 1974, Ser. No. 528,868
Int. Cl.² G11C *11/22, 13/08*
U.S. Cl. 340—173.2 **8 Claims**



1. An electrooptic storage device comprising a ferroelectric plate, one pair of writing electrodes on opposite surfaces of said ferroelectric plate, respectively, and one pair of erasing electrodes on opposite edges, respectively, of said ferroelectric plate, said writing electrodes comprising a thermally sensitive transparent resistor material having a switching characteristic at a switching temperature Ts and said switching temperature Ts being lower than the Curie temperature Tc of the material of said ferroelectric plate.

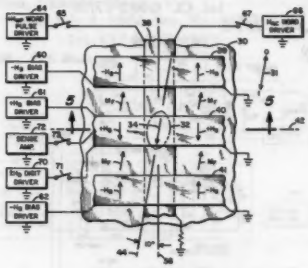
3,964,034

OLIGATOMIC FERROMAGNETIC FILM MEMORY SYSTEM UTILIZING FIELD STABILIZED DOMAINS

Ernest J. Torok, St. Paul; Roger E. Lund, Cottage Grove, and William J. Simon, Shakopee, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 484,833
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **10 Claims**

3. In a thin-ferromagnetic-planar-film memory in which the film is substantially continuous in two orthogonal directions and is of a thickness that is insufficient to permit the existence of interdomain Bloch walls of cross-tie walls, said film having an easy axis and in which information is stored in magnetic domains located at associated memory areas that are defined by the intersections of a word line and orthogonally oriented digit lines, the method of stabilizing said magnetic domains, comprising inductively coupling to said film an in-plane static, spatially alternating bias field that is substantially parallel to said word line and in the memory areas at said intersections is oriented in a first direction, but in the area between said



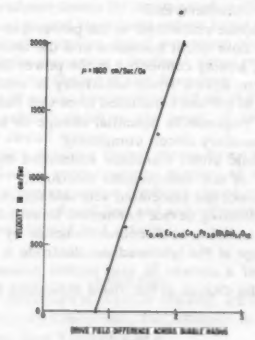
intersections is oriented in a second direction opposite to said first direction.

3,964,035

MAGNETIC DEVICES UTILIZING GARNET EPITAXIAL MATERIALS

Stuart Lawrence Blank, Madison, and Roy Conway Le Craw, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 23, 1974, Ser. No. 508,071
Int. Cl.² G11C *11/14*; C04B *35/40*
U.S. Cl. 340—174 TF **11 Claims**



1. Memory device comprising a substrate supporting at least a first epitaxial layer, the said layer being capable of evidencing uniaxial magnetic anisotropy capable of supporting local enclosed regions of magnetic polarization opposite to that of surrounding material, provided with first means for magnetically biasing said layer to stabilize said regions, second means for positioning such oppositely polarized local and enclosed regions, and third means for propagating such local regions, said material being of the garnet structure, characterized in that at least 75 percent of the total net moment of the material is contributed by europium as a dodecahedral site occupant, the said net moment being at least 100 Gauss.

3,964,036

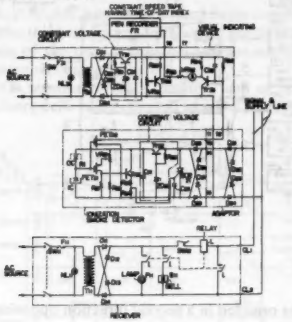
IONIZATION SMOKE DETECTOR CO-USED TO ISSUE FIRE ALARM AND DETECT AMBIENT ATMOSPHERE

Yasaburo Adachi, and Hiroaki Tsuru, both of Machida, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 306,678, Nov. 15, 1972, abandoned. This application Oct. 24, 1974, Ser. No. 517,673

Int. Cl.[2] G08B *17/10*

U.S. Cl. 340—237 S **17 Claims**



1. A measuring apparatus co-using an ionization smoke detector operative to initiate a fire alarm and to detect the ambient atmosphere, which comprises:

a main circuit comprising

a line adapted to be connected to a power source including an ionization smoke detector having an outer ionization chamber and an inner ioniation chamber connected in series with an intermediate electrode,

a field effect transistor connected to said line in parallel to the ionization smoke detector for control by the relative potential of said intermediate electrode located between said two chambers, and

an alarm device connected to the power line in parallel to both the field effect transistor and the ionization smoke detector, a relay connected in the power line to operate said alarm device when said relay is energized by an increase of current conducted from said field effect transistor in response to potential change in said electrode and an auxiliary circuit comprising

a second field effect transistor controlled by the relative potential of said intermediate electrode,

a second power line associated with said second transistor,

a visual indicating device connected to said second power line in parallel to said second transistor by which potential change at the intermediate electrode is converted to change of a current in said second power line and to display the change at the visual indicating device.

3,964,037

FUEL TANK ALARM SYSTEMS

David A. Lamphere, Milton, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Sept. 5, 1974, Ser. No. 503,440

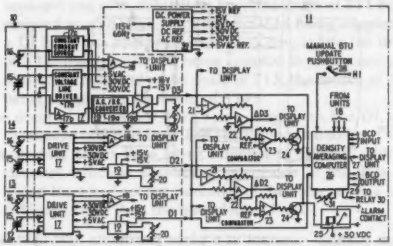
Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—244 R **13 Claims**

1. A system for indicating an abnormal density variation in a mass of liquid contained within a storage tank, comprising:

at least two density sensing means mounted in said tank at different respective heights for producing respective density output signals proportional to the density of the liquid at each respective height when said density sensing means are immersed in said liquid,

at least one density gradient sensing means connected to two of said density sensing means, for comparing the density output signals of the two density sensing means and for producing a density gradient output signal proportional to the density gradient in the liquid between the two density sensing means, and



alarm means connected to said density gradient sensing means, for producing an alarm indication when said density gradient output signal indicates an inverse density gradient in the liquid exceeding a predetermined value.

3,964,038

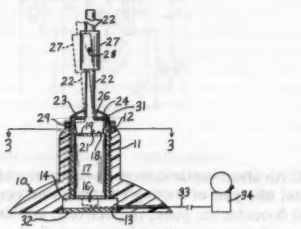
WIND INDICATOR

Talmadge O. Rutherford, P.O. Box 903, Rte. 1, Clanton, Ala. 35045

Filed July 7, 1975, Ser. No. 593,633

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—241 **7 Claims**



1. A wind indicator for indicating a predetermined increase in wind velocity comprising:

a. a movable arm supported adjacent one end and carrying a vertically extending cylindrical portion in spaced relation to said one end in position for wind to contact as wind passes thereby,

b. an actuator member carried by said one end of said movable arm and having a round, flat surface at one end thereof adapted to move to selected pivotal positions in response to a predetermined increase in wind velocity sufficient to move said cylindrical portion laterally from a vertical position,

c. a support member mounted in a supporting housing for vertical movement and having a flat surface in contact with said round flat surfaces of said actuator member supporting said actuator member for rocking movement in response to pivotal movement of said movable arm in any direction with said support member being movable in a vertical direction in response to said rocking movement of said actuator member, and

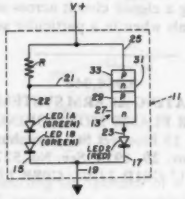
d. means operatively connecting said support member to a warning device so that said warning device is actuated in response to said predetermined increase in wind velocity to move said cylindrical portion laterally.

3,964,039

LUMINESCENT SOLID STATE STATUS INDICATORS

Magnus George Craford, St. Louis, and David Lee Keune, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 24, 1974, Ser. No. 536,145
Int. Cl.² G08B 21/00
U.S. Cl. 340—248 A 7 Claims



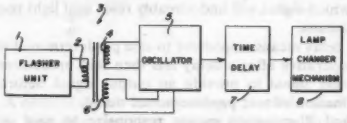
1. A luminescent solid state status indicator including at least first and second light emitting diodes adapted to emit first and second colors, respectively, common terminal means connected commonly to one side of both of said light emitting diodes and adapted to be connected to one of a pair of terminals of a source of DC energizing voltage, said energizing voltage being subject to variation in magnitude, first terminal means connected to the other side of the first light emitting diode, second terminal means connected to the other side of the second light emitting diode, wherein the improvement comprises a semiconductor circuit switching device having first, second, and third electrodes, the first electrode being interconnected with the first terminal means, the second electrode being interconnected with the second terminal means, the third electrode being connected to the other of said pair of terminals of the source of DC energizing voltage, said first and second electrodes being adapted selectively to energize the first and second light emitting diodes corresponding respectively to discrete magnitudes of said energizing voltage thereby to display different colors corresponding to the magnitude of said energizing voltage said switching device being operative to cause change from said first color to said second color when said energizing voltage reaches a preselected magnitude.

3,964,040

CIRCUIT FOR DETECTING BURNED-OUT LAMP FOR A BUOY LAMP CHANGER

Ravi Behl, Montreal, Canada, assignor to Vapor Corporation, Chicago, Ill.

Filed Oct. 29, 1974, Ser. No. 518,257
Int. Cl.² G08B 21/00; H05B 39/10
U.S. Cl. 340—251 11 Claims



1. A circuit for detecting inoperative lamps in an automatic lamp changer having a lamp change actuator for replacing said lamps with stored operative lamps, the circuit comprising:

a flashing lamp;

ocsillator means inductively coupled to the flashing lamp for generating an output signal when the lamp becomes inoperative; and

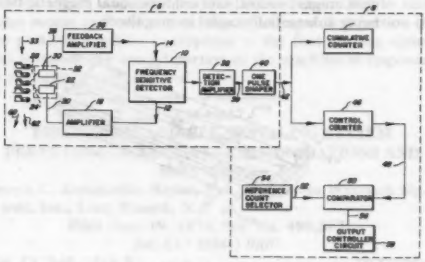
means for delaying the transmission of the output signal to said lamp change actuator until an output signal of predetermined duration occurs, thus precluding erroneous actuation due to transients.

3,964,041

ARTICLE DETECTION SYSTEM AND METHOD

James J. Hinds, La Grange, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed July 1, 1974, Ser. No. 484,768
Int. Cl.² G08B 13/18
U.S. Cl. 340—258 B 8 Claims



1. An article sensing and detection system comprising:

first transducer means for generating a sensing signal adapted to impinge on an article to be sensed;

frequency sensitive circuit means generating a continuous fixed frequency modulating signal, said frequency sensitive circuit means being responsive to a signal of said fixed frequency at its input for generating a first output and being responsive to the absence of a signal of said fixed frequency at its input for generating a second output;

first circuit means for applying said fixed frequency modulating signal to said first transducer means to effect oscillation of said sensing signal at said fixed frequency;

second transducer means for sensing said oscillating sensing signal, said second transducer means being responsive to said oscillating sensing signal impinging on an article to be sensed for generating a feedback signal respresentative thereof and oscillating at said frequency;

second circuit means for coupling said oscillating representative feedback signal to the input of said frequency sensitive circuit means;

said frequency sensitive circuit means being responsive to the presence a predetermined number of cycles of said oscillating representative feedback signal at its input for generating one of said first and second outputs indicative of the detection of said article.

3,964,042

STATIC MAGNETIC FIELD METAL DETECTOR

William L. Garrott, Gainesville, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 373,565, June 25, 1973, Pat. No. 3,896,608. This application Nov. 11, 1974, Ser. No. 522,378
Int. Cl.² G08B 21/00
U.S. Cl. 340—258 R 5 Claims

1. Apparatus responsive to passage of a metal object through one or the other of discrete contiguous portions of a region of space comprising:

first and second elongate magnetic-field generation means for producing respective first and second unidirectional magnetic fields in said discrete contiguous portions of said region of space,

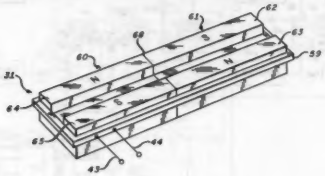
said first unidirectional magnetic field being opposite in sense to said second unidirectional magnetic field,

said first elongate magnetic field-generation means comprising first elongate permanent magnet means having

first and second elongate substantially parallel-disposed magnetic poles at one face thereof,

said second elongate magnetic-field generation means comprising second elongate permanent magnet means having third and fourth elongate substantially parallel-disposed magnetic poles at one face thereof,

said first, second, third and forth magnetic poles being characterized by production of said first unidirectional magnetic field of one sense adjacent said one face of said first elongate permanent magnet means and said second unidirectional magnetic field of opposite sense adjacent said one face of said second elongate permanent magnet means, said unidirectional magnetic fields being substantially equal in magnitude,



multiple conductor magnetic field pick-up coil means disposed substantially equally in stationary relation in said first and second unidirectional magnetic fields for providing a substantial detection signal in the presence of said object passing adjacent said first or adjacent said second elongate magnetic field-generation means while affording substantial cancellation of spurious magnetic field responses, and

utilization means coupled to said multiple conductor magnetic field pick-up coil means thereby responsive to the passage of said metal object through one or the other of said discrete contiguous portions of said region of space.

3,964,043

ELECTRONIC ALARM BOLT

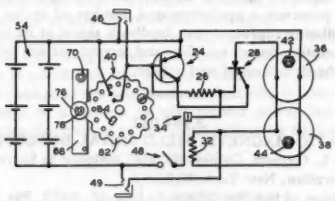
Georges R. Gratacap, Cannes, France, assignor to Seymour Gillman, New York, N.Y.

Filed Aug. 16, 1974, Ser. No. 498,180

Claims priority, application France, Sept. 14, 1973, 73.34417

Int. Cl.[2] G08B *13/08*

U.S. Cl. 340—274 R **8 Claims**



1. A self-contained electrically operated device for operation when a normally closed control circuit external to the device is opened comprising: first and second control terminals across which the control circuit is connected; a source of an operating voltage having first and second output terminals; a first switching means energized by said source of operating voltage and connected across said first and second control terminals for assuming a first operating state as long as a closed circuit exclusive of said first switching means exists across said first and second control terminals and for switching to a second operating state when said closed circuit does not exist; a second switching means energized by said source of operating voltage and having a trigger input means connected to said first switching means, a resetting means, and an output means, said second switching means for being triggered to a first operating state the first time said first switching means assumes its second operating state and remaining in said first operating state until the operating of said resetting means; an alarm means connected to the output means of said second switching means for giving an alarm as long as said second switching means is in its first operating state; and manually operable multiple position switching means for controllably connecting a closed circuit across said first and second control terminals when in a particular selected position.

3,964,044

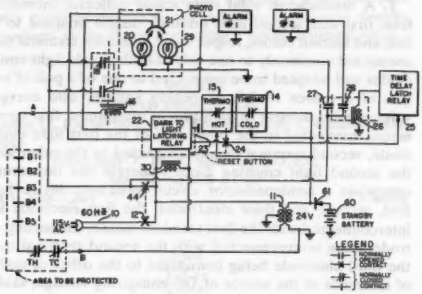
MULTIPLE OPERATING ALARM SYSTEMS EMPLOYING OIL BURNER FLAME MONITORING RELAYS

Anthony R. Busco, 15 Prospect St., Jamesburg, N.J. 08831

Filed Nov. 29, 1974, Ser. No. 527,953

Int. Cl.[2] G01D *21/04*; **G08B** *13/10*

U.S. Cl. 340—276 **10 Claims**



1. A multiple alarm system for monitoring the status of an area to be protected, comprising:

a. a series path sensor string including a relay coil in said path, said relay coil associated with at least a first contact, said contact capable of being in either one of two states; wherein is one of said states, said contact is closed and in said other state, said contact is opened,

b. first illumination means coupled to said contact and said illumination means operative to provide a light beam, when said coil is energized,

c. light responsive means responsive to said light beam to detect a transition from dark to light to provide upon detection of said condition, an output signal of an indefinite duration and operative upon detection of a light to dark condition to provide a predetermined duration signal, which signal will undesireably reset said light responsive means,

d. time delay means responsive to said predetermined signal and operative after a delay less then said predetermined duration signal to provide an output signal before the termination of said predetermined delay,

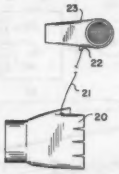
e. second illumination means responsive to said output signal of said time delay means to illuminate said light responsive means independent of said first illumination means to thereby assure that said predetermined duration signal does not reset said light responsive means whereby when said series string is broken and said coil is no longer energized, said light responsive means produces said indefinite duration signal, and

f. alarm means responsive to said indefinite duration signal to provide an indication when said series sensor string is broken.

3,964,045
OPERATOR ALERTING DEVICE

Cecil Conley, 9-S-675 Western Ave., Hinsdale, Ill. 60521

Continuation-in-part of Ser. No. 280,958, Aug. 16, 1972, Pat. No. 3,861,349. This application Dec. 9, 1974, Ser. No. 530,717
Int. Cl.² G08B 21/00
U.S. Cl. 340—279 2 Claims

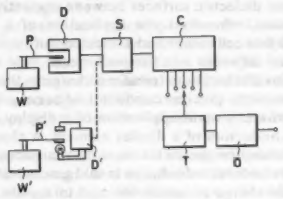


1. Means for alerting an operator of a motor vehicle who has drowsed off, comprising, in combination, an attention-producing means including trigger or switch means for setting off the same, means for mounting said attention-producing means on a fixed part of said vehicle generally above the steering wheel thereof, a glove or hand-worn member of the operator's hand, and a cord or other flexible member interconnecting said trigger means and said glove or hand-worn member, said cord or other flexible member having a length such that it is not taut when the operator's hand is on the steering wheel but becomes taut before the operator's hand drops to his thigh and said glove including a thumb-receiving pocket and an index finger-receiving pocket with said pockets being attached to each other in juxtaposed relationship so that the wearer's thumb cannot by itself hook over the rim of the steering wheel.

3,964,046
CONTROL DEVICE FOR A PORTABLE MACHINE

Kiyoshi Takahashi, Kunitachi, and Noritsugu Hirata, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 184,691, Sept. 29, 1971, abandoned. This application May 20, 1974, Ser. No. 471,560
Claims priority, application Japan, Oct. 2, 1970, 45-86941; Oct. 2, 1970, 45-98497
Int. Cl.² G08B 1/00
U.S. Cl. 340—309.1 9 Claims

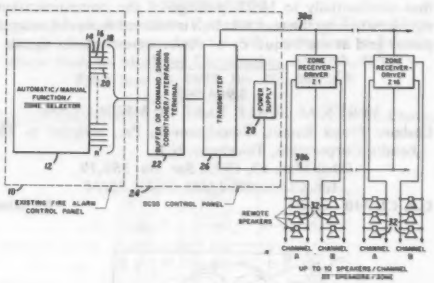


1. A control device for actuating a portable machine, comprising portable timepiece means having a first indicating member which repeats one cycle of movement over one time, and a second indicating member which repeats one cycle of movement over a second time period shorter than the first time period, detecting means including a first detector for detecting each repetition of movement of the first indicator member and a second detector for detecting each repetition of movement of the second indicating member, a single retaining circuit connected to said first detector to be set thereby and to produce an electrical mark in response to the output of the first detector, a gate circuit responsive to the output of said signal retaining circuit and said second detector circuit for passing the next output from said second circuit when the signal retaining circuit is set, said signal retaining circuit being responsive to the gate circuit and being reset thereby so as to close the gate in response to passage by the gate of the first one of the outputs from said second detector after the output from the first detector, a counter coupled to the gate and responding to the output of the gate for counting a predetermined number of signals from the gate, delay means connected to the counter for selecting a predetermined number of output signals of the counter to generate a first starting signal, and to generate a second starting signal delayed by a predetermined period of time from the generation of the first starting signal, and output control means connected to said delay means and said counter for actuating a first portion of the portable machine in response to the first starting signal and actuating the second portion of the machine in response to the second starting signal.

3,964,047
FIRE-ALARM AUDIBLE SIGNALING SYSTEM PERMITTING SELECTIVE COMMUNICATIONS AND SIGNALING

Joseph C. Antonaccio, Hazlet, N.J., assignor to Wheelock Signals, Inc., Long Branch, N.J.

Filed June 19, 1974, Ser. No. 480,867
Int. Cl.² H04Q 9/00
U.S. Cl. 340—310 R 10 Claims



1. A fire-alarm audible signaling system permitting selective communications and signaling and comprising transmitter means, receiver-driver means, and circuit means connecting said transmitter means and said receiver-driver means, wherein said transmitter means comprises logic means for generating information in digital form, a ones oscillator for continuously generating a tone of a first frequency representing digital ones, a zeros oscillator for continuously generating a tone of a second frequency representing digital zeros, a pair of field-effect transistor switch means electrically connected between said circuit means and said oscillators, respectively, and a pair of NAND-gates having outputs respectively connected to gate said field-effect transistor switch means, whereby said respective field-effect transistor switch means open and close in accordance with said digital information generated by said logic means in order to impress on said circuit means a series of tone bursts of different frequencies conveying said information.

3,964,048
COMMUNICATING OVER POWER NETWORK WITHIN A BUILDING OR OTHER USER LOCATION

Joe F. Lusk, Medford, and William H. Rood, Acton, both of Mass., assignors to General Public Utilities Corporation, New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,184
Int. Cl.² H04M 11/04
U.S. Cl. 340—310 R 7 Claims

1. Apparatus comprising an external power grid for delivering electrical power at a given frequency to a user location

such as a building, power lines within the user location connected to the external power grid for distributing electrical power within the user location, communications means at at least two stations within the user location connected to the power lines within the user location and adapted to transmit communications signals over the power lines, the communications signals having a frequency different from the frequency of the electrical power supplied by the external power grid,

(FIG. 3)

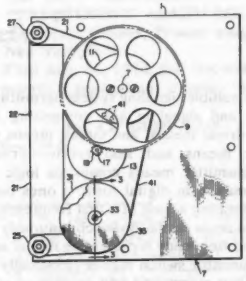
and filter means inserted in series between the external power grid and the power lines within the user location, the filter means being tuned to present a closed circuit to the electrical power and thus to pass the electrical power but present substantially an open circuit to the communications signals and thus substantially to block passage of the communications signals, whereby the user location is isolated from the external power grid at the frequency of the communications signals.

3,964,049

VERTICAL SCALE TAKE UP MECHANISM

Casimer Frank Remus, Tunkhannock, Pa., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 13, 1975, Ser. No. 558,19.
Int. Cl.² G08B *23/00*; F16H *35/18*
U.S. Cl. 340—317 **6 Claims**



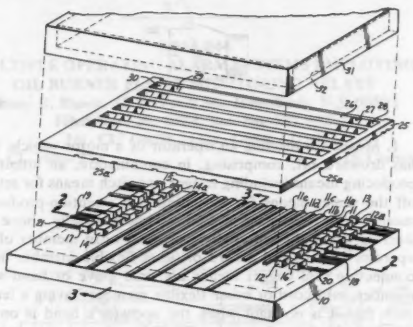
1. An indicator comprising scale means and index means movable relative to one another for indicating a condition sensed by a signal condition device, a servomotor responsive to signals from said device, a pair of drums, a flexible band having one of the scale means or index means thereon wound on the drums, means other than the flexible band drivably connecting the servomotor to the drums for positively rotating one drum in a direction for winding the flexible band thereon and for positively rotating the other drum in the opposite direction for winding the flexible band thereon to move the scale means or index means in both directions, said driving means including spring means between the driving means and only one drum for accommodating only relative rotation between the drums as the flexible band winds from one drum to the other when the drums rotate through different angles in accordance with the amounts of flexible band wound on the drums.

3,964,050

PLASMA DISPLAY PANEL

William N. Mayer, White Bear Lake, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed May 21, 1975, Ser. No. 579,642
Int. Cl.² H01J *17/48*
U.S. Cl. 340—324 M **15 Claims**



1. A display device having a plurality of display elements, said display device comprising a substrate supporting a plurality of elongated conductors in a substantially planar array, each of said conductors being substantially parallel to the others of said conductors; a plurality of first cell means adjacent an end one of said conductors, each of said first cell means including first and second electrodes; dielectric means overlying said conductors, said dielectric means having a plurality of elongated surfaces extending substantially normal to the length of said conductors, one end of each of said surfaces being adjacent to a respective one of each of said first cell means; confining means for confining a gaseous atmosphere contiguous to said dielectric surfaces and said first cell means, each of said display elements being defined by a region of each of said dielectric surfaces between respective pairs of said conductors, whereby upon application of a discharge potential to a first cell means and a selected shift voltage to the one conductor adjacent said first cell means, said respective first cell means discharges to transfer a charge to the dielectric surface adjacent the said one conductor adjacent said first cell means and whereby upon application of a display voltage to the pair of conductors of a display element, a charge difference accumulated on the dielectric surface adjacent said pair of conductors initiates a discharge in said gaseous atmosphere to reverse the charge accumulation and to sustain display of said element.

3,964,051

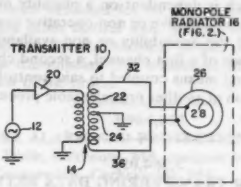
ELECTROSTATIC COMMUNICATION SYSTEM

Lewey O. Gilstrap, Jr., Washington, D.C., assignor to Infodyne, Inc., Arlington, Va.

Continuation-in-part of Ser. No. 331,567, Feb. 12, 1973, abandoned. This application June 6, 1974, Ser. No. 476,887
Int. Cl.² H04B *13/00*
U.S. Cl. 340—4 A **6 Claims**

1. An underwater electrostatic wave antenna, comprising a monopole radiator including a pair of concentric electrically conductive spheres, a dielectric material separating said

spheres, means on said outer sphere to insulate said sphere from water when submerged in water, and means for applying



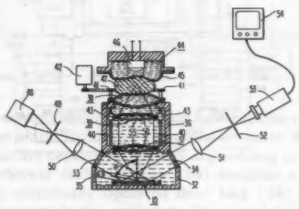
varying voltages of opposite polarity to said spheres respectively.

3,964,052

ACOUSTICAL IMAGING SYSTEM

Gary Norris Langlois, Richland, Wash., assignor to Holosonics, Inc., Richland, Wash.

Filed Mar. 28, 1975, Ser. No. 563,219
Int. Cl.² G01N 29/04
U.S. Cl. 340—5 H **19 Claims**



1. An acoustical imaging system comprising:
a first enclosure for confining a liquid therein and having an opening in an upper surface thereof;
a detector disposed beneath said opening and within said first enclosure and having a surface exhibiting a pattern of deformations when impinged upon by acoustic energy;
a first source of acoustic energy adapted to direct a first beam of said energy upon said detector surface at an oblique angle thereto;
a first yieldable acoustically transparent member closing said opening in said first enclosure tor coupling the interior of said first enclosure to an object to be examined;
a second enclosure for confining a liquid therein and including a second yieldable acoustically transparent portion for coupling the interior of said second enclosure to the object;
a second source of acoustic energy disposed within said second enclosure and adapted to direct a second beam of said energy through the object toward and substantially normal to said detector surface;
means for directing illuminating radiation upon the surface of said detector; and
means for observing said surface.

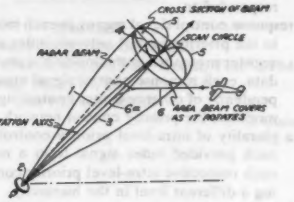
3,964,053

AIRCRAFT GUIDING SYSTEM

William H. Heiser, Ramsey, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 15, 1957, Ser. No. 646,496
Int. Cl.² G01S 1/08
U.S. Cl. 343—108 M **5 Claims**

1. A system adapted to guide an aircraft along a path defined by frequency modulated signals of a transmitted conical scan pattern, comprising a receiver carried by said aircraft to receive said signals, means to detect from said signals and the amplitude modulation of said signals carried by the movement of said aircraft relative to the axis of said conical scan pattern any rate of change of the direction of movement of said aircraft with respect to the nutation axis of said conical scan pattern, and means responsive to said detected rate of change to direct the movement of said aircraft along a path within said conical scan pattern defined by any line of constant scan modulation.

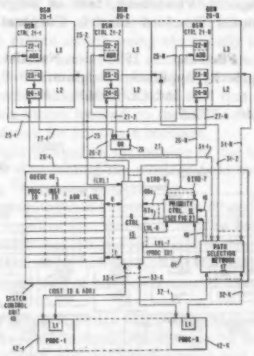


3,964,054

HIERARCHY RESPONSE PRIORITY ADJUSTMENT MECHANISM

Eugene Joseph Annunziata, Hyde Park, and Neal Taylor Christensen, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1975, Ser. No. 589,228
Int. Cl.² G06F 9/18
U.S. Cl. 340—172.5 **6 Claims**



1. A system for controlling the priority of simultaneous responses to plural requests for data from different levels of a computer storage hierarchy, including a plurality of different levels having different data access rates, the hierarchy including means for initially responding with a level signal indicating which level is to respond to the request for data transfer, simultaneous responses competing for a common transfer path for moving the requested data, comprising
a queue in a priority control network, the queue including a plurality of indexed slots, the indexed slots receiving requests for data from a computer,
level-determining means in said hierarchy providing the level signal to the priority control network for indicating the hierarchy level which is to respond to each request put into a queue slot at a particular index in the queue,

a plurality of basic storage modules in said hierarchy, each module containing at least two different access-time levels in the hierarchy,

register means in each module for storing an index signal from the priority control network indicating the particular index of the queue slot containing the request to be responded to,

response control signal means in each module for providing to the priority control network index signal stored in the register means when the module is ready for a transfer of data, each response control signal means operating independently of other response control signal means in other modules, the priority control network also including:

a plurality of intra-level priority control circuits receiving each provided index signal from a responding module, each respective intra-level priority control circuit servicing a different level in the hierarchy,

inter-level connecting means between the intra-level priority control circuits to disable each higher-level priority control circuit when a slower-level priority control circuit is receiving the level signal from the level determining means, one of the intra-level priority control circuits being activatd by the level signal,

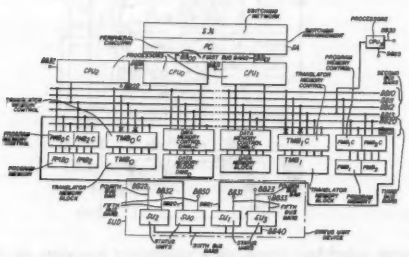
means receiving the output of the activated intra-level priority control circuit to provide to the queue an index output signal corresponding to a selected one of one or more provided index signals received from one or more respective response control signal means, thereby giving priority to a data transfer by the module assigned to the selected index signal.

3,964,055

DATA PROCESSING SYSTEM EMPLOYING ONE OF A PLURALITY OF IDENTICAL PROCESSORS AS A CONTROLLER

Valére Jean Marie Carruet, Mechelen, and Freddy Josse Melanie Verspecht, Viezenbeek, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,741
Claims priority, application Belgium, Oct. 9, 1972, 789828
Int. Cl.² G06F *11/00*
U.S. Cl. 340—172.5 **11 Claims**



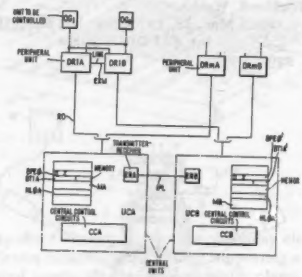
1. A data processing control system adaptable to be connected to a plurality of processors which are substantially all alike, a plurality of memory units, which are substantially all alike, a plurality of memory units, a status unit device, a group of said processors being pre-selectable to execute programs stored therein, and first channel means coupled from the status unit device to said pre-selectable processors over which a single one of said pre-selectable processors from said group of pre-selectable processors may be selected as the most suitable one to execute said programs, a switching arrangement coupled to each of said pre-selectable processors by an individual second channel, means coupling each of said processors to a plurality of said memory units via an individual third channel, means coupling each of said pre-selectable processors to all said memory units via an individual first channel and means including a control circuit coupled via a fourth channel with a pre-selected processor to enable a pre-selected processor to calculate for each processor, itself included, the value of a function which is dependent on a plurality of variables which determine the operative or non-operative conditions of the processor and the availability or non-availability to the respective processor of a first channel, a second channel and a third channel, and means coupled to said control circuit to enable pre-selection of another pre-selectable processor as the most suitable one.

3,964,056

SYSTEM FOR TRANSFERRING DATA BETWEEN CENTRAL UNITS AND CONTROLLED UNITS

Jean Charpentier, Issy-les-Moulineaux; Genevieve Cancian, and Francois Selz, both of Paris, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

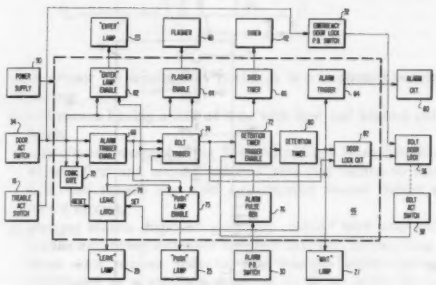
Filed Apr. 8, 1974, Ser. No. 458,691
Int. Cl.² G06F *15/16, 11/04*
U.S. Cl. 340—172.5 **3 Claims**



1. A system enabling the transfer of data between central units and controlled units comprising at least two central units, a plurality of groups of controlled units, a plurality of peripheral units including one peripheral unit per group of controlled units and per central unit, means connecting said peripheral unit to receive orders from the central units and retransmit them to the controlled units; means linking the two central units including an information-transmission link, each central unit including central control circuits, each central unit including a first storing device for each peripheral unit assigned to the central unit for storing information indicating whether the corresponding periperal unit is accessible by the central unit or not; whereby when a central unit is preparing to transmit an order to a peripheral unit, the central control circuits read the information provided by the first storing device corresponding to the peripheral unit and, according to the read information, control either the transmission of the order directly to the peripheral unit, or the transmission to the other central unit, through the transmission-link, of a message containing the order and the identity of the peripheral units, each central unit including a second storing device for every periperal unit assigned to the other central unit for storing information indicating whether the other central unit has access to that peripheral unit; means arranged so that when a central unit has an order to transmit to a group of controlled units, but lacks access to its peripheral unit, the central control circuits read the information contained in the second storing device corresponding to the analogous peripheral unit of the other central unit and, according to the read information, they enable the transmission of the order to the other central unit, through the transmission-link, each central unit including a third storing device for every peripheral unit assigned to the central unit for storing characteristic information when the central unit transmits, for the account of the other central unit, an order to the peripheral unit; the central con-

trol circuits examining, at the end of the execution of an order by the peripheral, the information contained in the third storing device, which will then enable it to determine whether the order has been executed for its own account or for the account of the other central unit; and, in this latter case, the central control circuits transmit to the other central unit, through the transmission link, a message informing of the end of execution of the order.

3,964,057
FIRE ALARM AND PROTECTION BOOTH
Ronald H. Wells, Baltimore, Md., assignor to Fire Alarm Marketing Corporation, Cockeysville, Md.
Filed May 28, 1975, Ser. No. 581,434
Int. Cl.² G08B *21/00*
U.S. Cl. 340—304 **16 Claims**



1. In a control circuit for a booth type enclosure adapted to actuate an alarm circuit for signalling an alarm, for example to the local fire department, as well as providing an emergency refuge, wherein said enclosure (**10**) includes a door (**12**) having an electrically operated door lock (**36**) adapted to detain a person in the enclosure for a predetermined time period after the signalling of the alarm, a floor treadle (**16**), first switch means (**34**) actuated by the opening and closing of the door (**12**), second switch means (**18**) adapted to be actuated by the person's weight upon the floor treadle (**16**), third switch means (**36**) actuated by the door lock, and fourth switch means (**30**) actuated by the person in the enclosure for initiating an alarm signal, the improvement comprising:

first binary logic circuit means (**82**) adapted to cause energization of the door lock (**36**) and having a first and second input signal applied thereto, each of said input signals being adapted to provide a respective control signal for energizing the door lock;

circuit means (**76**) coupled to said fourth switch (**30**) means for providing an output signal upon one actuation of said fourth circuit means and thereafter being insensitive to further actuation;

second binary logic circuit means (**74**) coupled to and responsive to said output signal and at least one enabling signal and being operable to provide said first input signal to said first binary logic circuit means for initially energizing said door lock temporarily to insure operational capability of the door lock and thereby actuating said third switch means (**38**);

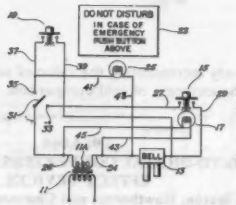
third binary logic circuit means (**68**) coupled to said first and second switch means (**34** and **18**) and being responsive to the binary operating states thereof to provide said at least one enabling signal when the door (**12**) is closed and the foot treadle (**18**) is actuated;

fourth binary logic circuit means (**72**) coupled to and responsive to said first input signal and to the binary operating state of said third switch means (**38**) when actuated to provide a timer circuit actuating signal;

detention timer circuit means (**80**) coupled to and responsive to said actuating signal and generating said second input signal to said first binary logic circuit means (**82**) and continuously energizing said door lock for a predetermined time period following said first input signal and thereafter deenergizing said door lock; and

alarm trigger circuit means (**84**) coupled to said detention timer circuit means (**80**) and being rendered operative thereby when actuated to operate said alarm circuit (**60**).

3,964,058
DO NOT DISTURB DOORBELL
Billy G. Winston, 1900 E. 4th St., Fort Worth, Tex. 76104
Filed May 28, 1974, Ser. No. 473,561
Int. Cl.² G08B *3/00*
U.S. Cl. 340—330 **2 Claims**



1. A doorbell system for a business or residence comprising:

an electrical transformer,

an electrically actuated bell located in said business or residence and coupled to said electrical transformer,

switch means coupled to said electrical transformer and movable to first and second positions,

a first push button switch located on the outside of the business or residence at a convenient location,

said first push button switch being electrically coupled to said switch means and to said electrical transformer by way of said bell for energizing said bell when pushed and when said switch means is moved to said first position,

message holding means located on the outside of the business or residence for holding a message,

an electrical light located on the outside of the business or residence for illuminating the message held by said message holding means,

circuit means coupling said electrical light to said electrical transformer to allow said electrical light to be energized when said switch means is moved to said second position,

a second push button switch located on the outside of the business or residence at a position spaced from said first push button switch,

said second push button switch being coupled to said switch means and to said electrical transformer by way of said bell for energizing said bell when pushed and when said switch means is moved to said second position.

3,964,059
METHOD AND APPARATUS FOR STATISTICAL COUNTING
Robert Morris, Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 19, 1974, Ser. No. 480,639
Int. Cl.² H03K *13/00*
U.S. Cl. 340—347 DD **9 Claims**

1. A method for recording the count of electrical pulse signals comprising the steps of:

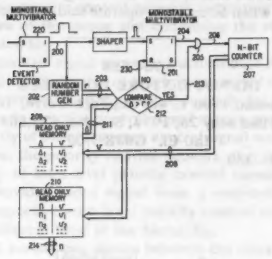
detecting that an electrical pulse has occurred,

generating a sequence of random numbers,

storing a count bearing a desired relation to the number of the detected pulses,

generating a comparison number having a preselected relation to said count,

for each detected pulse, comparing one of said random numbers with said comparison number, and



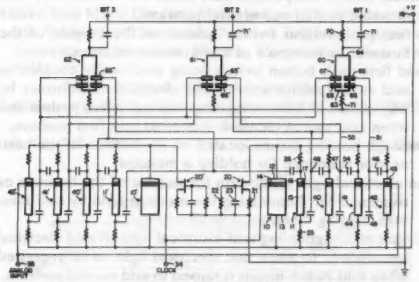
selectively incrementing the value of said count depending on the outcome of said comparison.

3,964,060

ANALOG-TO-DIGITAL CONVERTERS UTILIZING GUNN EFFECT DEVICES

Dale H. Claxton, Hawthorne, and Chauncey S. Miller, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed July 2, 1975, Ser. No. 592,421
Int. Cl.² H03K *13/17*
U.S. Cl. 340—347 AD **30 Claims**



1. In a comparator circuit for an analog-to-digital converter, a differential amplifier pair comprising:

a. a first and a second transferred electron device, each having two ohmic electrodes and a Schottky barrier electrode;

b. a constant current device common to both of said devices for biasing said ohmic electrodes to provide a cathode and an anode for each device, each of said Schottky electrodes being disposed adjacent the associated cathode;

c. means for applying a clock pulse to the Schottky electrode of said first device; and

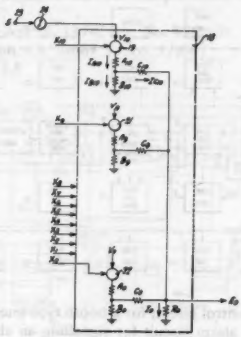
d. means for applying an analog signal to be converted to the Schottky electrode of said second device, each of said devices having a current-voltage characteristic including a negative resistance branch preceded by a knee said first device being biased near the knee of the current-voltage characteristic, and said second device being biased further from the knee of the current-voltage characteristic, whereby a clock pulse will bias said first device into the negative resistance branch and said second device near the knee so as to be able to respond to the analog signal.

3,964,061

SUCCESSIVE APPROXIMATION ANALOG TO DIGITAL CONVERTER

Howard H. Aiken, 1511 S. Ocean Drive, Fort Lauderdale, Fla. 33316

Continuation of Ser. No. 437,479, Jan. 28, 1974, abandoned, which is a division of Ser. No. 288,957, Sept. 14, 1972, Pat. No. 3,815,144. This application Aug. 26, 1975, Ser. No. 607,992
Int. Cl.² H03K *13/17*
U.S. Cl. 340—347 AD **4 Claims**



1. An analog to digital converter for converting an analog electrical voltage to a digital number comprising a plurality of (0 to *i*) voltage generating means connected in parallel with each other for generating a plurality of trial voltages of a polarity opposite to that of the signal voltage addition means for adding said trial voltages one at a time in decreasing order of magnitude to said signal voltage to form cumulative sum voltages at each addition step, each of said voltage generating means comprising reference voltage means S*m*, a voltage divider gating means selectively actuated to couple said reference voltage to said voltage divider, each said voltage divider comprising a first resistor A*i*, a second resistor B*i* connected in series therewith to ground, and a third resistor C*i* connecting the junction of A*i* and B*i* to said addition means, the values of A*i*, B*i* and C*i* for each of the *i* voltage dividers being related to each other and satisfying the equations

$$\frac{Bi}{Ai + Bi} = 2^{1-10} \text{ and } \frac{Ai\,Bi}{Ai + Bi} + Ci = K$$

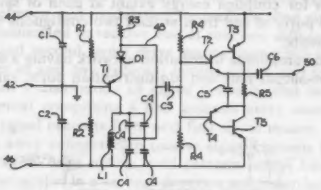
where *K* is a constant, polarity sensing means for determining at each addition step the polarity of said cumulative sum voltage, digit generating means for generating a logical 1 if the cumulative sum voltage after a particular addition step is of one polarity and generating a logical 0 if said cumulative sum voltage after that particular addition step is of a polarity opposite to said one polarity, means responsive to the generation of said logical 1 to continue adding that particular trial voltage to said cumulative sum voltage at succeeding addition steps, whereby each addition step directly and sequentially generates one digit of a digital number corresponding to the magnitude of the signal voltage.

3,964,062

KEYBOARD SWITCH SYSTEM

Delbert Flagg, Huntington Beach, and Miroslaw Balodis, Garden Grove, both of Calif., assignors to Signal Laboratories, Inc., Orange, Calif.

Filed Dec. 9, 1974, Ser. No. 530,936
Int. Cl.² G08C 1/00
U.S. Cl. 340—365 L 14 Claims



1. A sensor for sensing key positions in a keyboard system comprising:

a coil means having a coil of wire with first and second coil leads,

a capacitance means having first and second leads coupled to said first and second leads of said coil means so that said coil means and said capacitance means define a tuned circuit,

a plunger means disposed generally coaxial with said coil means and being slideable between first and second locations with respect thereto, said plunger means being fabricated of a selected material so as to result in an impedance of said coil means when said plunger is in said second location which is substantially different from the impedance of said coil when said plunger is in said first location,

means for supply electrical power at a fixed frequency to said tuned circuit, and

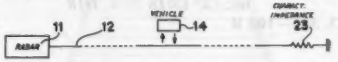
means for providing an output signal at said fixed frequency and modulated in amplitude responsive to the changes in said tuned circuit due to changes in the impedance of said coil.

3,964,063

TRAFFIC-SURVEILLANCE SYSTEM

Jean-Raymond Narbaits-Jaureguy, and Henri Billottet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 2, 1973, Ser. No. 375,444
Claims priority, application France, July 6, 1972, 72.24465
Int. Cl.² G01S 9/00
U.S. Cl. 343—5 PD 7 Claims



1. A system for the surveillance of traffic along a route traversed by a succession of vehicles to be monitored comprising:

a radar installation provided with a source of high-frequency signals, transmission means connected to said source for emitting said signals, reception means for signals reflected by extraneous objects, and indicator means for reflect signals connected to said reception means;

antenna means including a hollow elongate conductor extending along said route for radiating said signals and picking up reflections thereof from passing vehicles, said conductor being connected at one end to said transmission and reception means; and

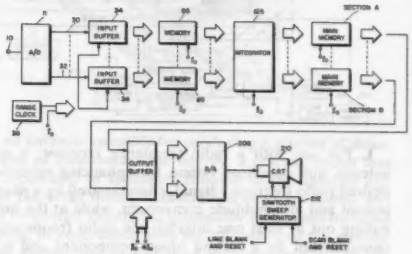
a load connected to the other end of said conductor, said load having an impedance matching the characteristic impedance of said antenna means, said conductor having a longitudinally extending slot diverging from said one end to said other end at a rate providing a substantially uniform radiating field along said route.

3,964,064

DATA DISPLAY SYSTEM HAVING A MULTILEVEL VIDEO STORAGE DEVICE

Ruy L. Brandao; Robert A. Taylor, Jr., both of Fort Lauderdale, Fla., and The Bendix Corporation, 02, Southfield, Mich.

Continuation-in-part of Ser. No. 291,116, Sept. 21, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 418,154
Int. Cl.² G01S 7/04
U.S. Cl. 343—5 SC 29 Claims



1. A display device for a radar system wherein a train of first signals corresponding to radar transmissions is generated and which receives a sequence of radar return signals, said device including a master oscillator means for generating a plurality of coherent control signals, comprising:

an analog to digital converter for converting each said radar return signal into at least first and second parallel binary words, each said word being comprised of a train of serial binary bits;

a plurality of input means, each associated with an individual one of said binary words and each said input means having a capacity to store a predetermined number of binary bits;

a main memory including a plurality of individual circulating memories, each associated with an individual one of said input means;

first gate means responsive during a first period to said first signals for communicating each said binary word to its associated input means whereby said binary words are stored in a bit-by-bit manner, and for communicating each said input means to its associated circulating memory in response to said coherent control signals whereby a binary word previously stored in said input means is stored in said main memory;

a plurality of output means, each associated with an individual one of said circulating memories;

utilization means responsive to said coherent control signals for displaying binary data applied thereto; and

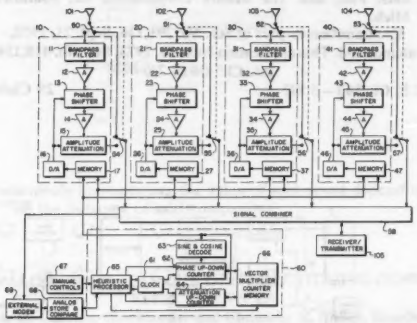
second gate means responsive to said coherent control signals for communicating each said circulating memory to its associated output means whereby binary words stored in said circulating memories are stored in said output means, and for applying the binary words stored in said output means to said utilization means.

3,964,065

STEERABLE ANTENNA NULL COMBINER SYSTEM

Eugene L. Roberts, Maitland, and Thomas J. Steffancin, Orlando, both of Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1974, Ser. No. 533,562
Int. Cl.² H04B 7/00
U.S. Cl. 343—100 LE 16 Claims



1. For use with a radio frequency receiver, a steerable antenna null combiner system for enhancing reception of a desired radio frequency signal, characterized by a phase component and an amplitude component, while at the same time nulling out at least one interference radio frequency signal, characterized by a second phase component and a second amplitude component, over a broad band comprising:

a. external decision means for providing external control instructions, said external decision means responsive to the enhanced reception of said desired radio frequency signal and the decreased reception of said interference radio frequency signal as received by said radio frequency receiver;

b. control processor means responsive to said external decision means for converting said external control instructions into a sequence of control signals;

c. a plurality of input means for accepting said radio frequency signals;

d. respective adjustment means connected to all but one of said input means and responsive to said control signals from said control processor for adjusting said phase components and said amplitude components of said ratio frequency signals;

e. second adjustment means connected to said one of said input means and responsive to said control signals from said control processor for adjusting at least said amplitude components of said radio frequency signals; and

f. combiner means connected to the outputs of all of said adjustment means for combining said radio frequency signals and for conveying said combined radio frequency signals to said receiver.

3,964,066

ELECTRONIC SCANNED CYLINDRICAL-ARRAY ANTENNA USING NETWORK APPROACH FOR REDUCED SYSTEM COMPLEXITY

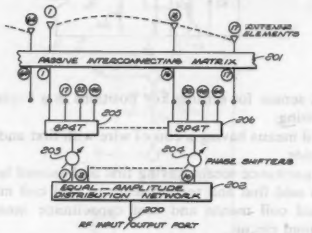
Jeffrey T. Nemit, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,193
Int. Cl.² H04B 7/00
U.S. Cl. 343—100 SA 12 Claims

1. A switching and interconnecting system for discretely exciting one of q groups comprising a fraction n/q contiguous elements of the total circumferentially arranged radiating elements n of an array of antenna elements extending over coupling least a portion of said circumference matrix producing a beam directive in the plane containing said circumference and for controllable coarse and fine pointing of said beam, comprising:

a passive interconnecting matrix having n output ports each connected discretely to a corresponding one of said n antenna elements and also having n feed ports, said matrix including a plurality of interconnecting hybrid devices for couplign energy extant at each of said matris feed ports to and from at least two contiguous radiating elements;

an equal-amplitude distribution network having a single RF input-output port and n/q distribution ports, said input-



output port constituting the input-output terminal for said switching and interconnecting system;

n/q phase shifters, one of said phase shifters being connected to each of said distribution ports of said equal-amplitude distribution network to provide a set of n/q discretely phase shifted RF drive signals for producing a corresponding predetermined fine beam pointing angle;

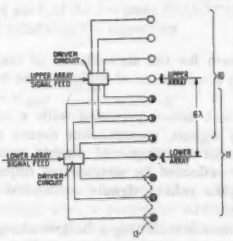
and n/q single pole, q position selector switches each arranged for switching a corresponding one of said phase-shifted RF drive signals among the like-positioned elements in each of said q groups of elements discretely to provide said coarse beam positioning with respect to which said fine beam pointing is effected.

3,964,067

GLIDE PATH SIGNAL TRANSMISSION SYSTEM

James Godfrey Lucas, 12, Woniora Ave., Wahroonga, N.S.W. 2076, Australia

Continuation-in-part of Ser. No. 295,931, Dec. 4, 1974, abandoned. This application Oct. 23, 1974, Ser. No. 517,303
Claims priority, application Australia, Oct. 11, 1971, 6592/71
Int. Cl.² G01S 1/16, 1/18
U.S. Cl. 343—108 R 3 Claims



1. A glide path signal transmission system for indicating to an aircraft a perdetermined glide path within an aircraft guidance region comprising: carrier wave radio frequency generating means for generating a carrier wave; modulating means connected to receive and modulate the carrier wave and to

provide at a first output terminal a first modulated signal comprising the carrier wave modulated with a first modulating frequency and to provide at a second output terminal a second modulated signal comprising the carrier wave modulated with a second different modulating frequency; hybrid signal combining means connected to receive said first and second modulated signals and to provide from them two different output signals having a predetermined relationship to one another and in each of which a constant but different relationship exists between said modulating frequencies; first signal drive means connected to receive one of said two different output signals and second signal drive means connected to receive the other of said two different output signals and to develop therefrom a distribution of signal currents; and an antenna arrangement comprising a first antenna array connected to receive signal currents from said first signal means, a second antenna array connected to receive signal currents from said second signal drive means, said antenna arrays having their centres separated in a vertical direction and being individually constituted by antenna elements of which a predetermined number are common to both arrays such that each of said signal drive means supplies the elements of its associated array with a distribution of signal currents in such manner as to substantially obviate reflected radiation of the transmitted radiation within said aircraft guidance region, and said elements unique to the first and second arrays are fed by their respective drive means with first and second drive signals respectively whereas the elements which are common to the two arrays are fed with a combination of signals from said drive means.

3,964,068

WINDOW ANTENNA AND DEFROSTER FOR USE IN MOTOR VEHICLE

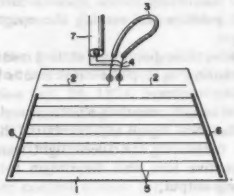
Taketsugu Torii, 1827-2, Fujiyama, Shiroyama-cho, Kasugai, Aichi, and Minoru Nishio, 44, Kawara, Tenpaku-cho, Okazaki, Aichi, both of Japan

Filed Jan. 6, 1975, Ser. No. 538,901

Claims priority, application Japan, Jan. 14, 1974, 49-7432[U]

Int. Cl.² H01Q *1/32*

U.S. Cl. 343—704 **3 Claims**



1. A window antenna device for use in a motor vehicle, comprising:

a balanced type antenna secured to the rear window of said vehicle, said window having a moisture preventive heating wire;

a coaxial feeder connected to said antenna;

a gain compensating circuit connected to connections between said antenna and said feeder to balance the current flow in said antenna, said circuit being adapted to function at an average FM frequency between the lowest frequency and the highest frequency to which FM radio equipment connected to said coaxial feeder can be tuned, and said circuit being embedded in the roof of the motor vehicle.

3,964,069

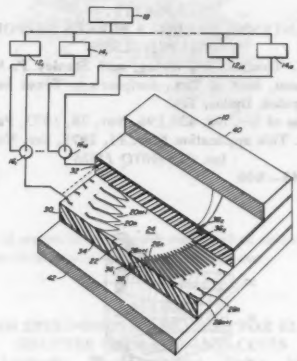
CONSTANT BEAMWIDTH ANTENNA

Robert J. McDonough, Ventura, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed May 1, 1975, Ser. No. 573,697

Int. Cl.² H01Q *19/06*

U.S. Cl. 343—754 **3 Claims**



1. In an antenna assembly for producing a plurlity of directive beams of electromagnetic energy, a printed circuit lens having a plurality of feedports coupled to the antenna elements in the array through constrained electrical paths, and wherein frequency dependent attenuator means are included for varying, in accordance with the frequency of the electromagnetic energy, the amplitude of such electromagnetic energy in such constrained paths, the improvement characterized by such frequency dependent attenuator means including a radio frequency energy absorbing material disposed in portions of the constrained electrical paths the physical size of such material varying progressively in accordance with the frequency-amplitude variation of such frequency dependent attenuator means.

3,964,070

CORRUGATED HORN HAVING MEANS FOR EXTRACTING DIVERGENCE-MEASURING MODES

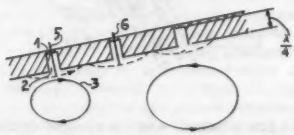
Serge Drabowitch, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 18, 1974, Ser. No. 533,772

Claims priority, application France, Dec. 20, 1973, 73.45822

Int. Cl.² H01Q *13/02*

U.S. Cl. 343—786 **10 Claims**



1. A horn for an antenna system, comprising a wall centered on an axis with an inner peripheral surface diverging from said axis from one end to the other, said wall being provided on said surface with a multiplicity of circumferential grooves having a depth on the order of a quarter wavelength of an operating frequency, the axial spacing of said grooves being a substantial fraction of said wavelength up to substantially half

said wavelength, and divergence-measuring circuitry responsive to odd modes derived from a hybrid fundamental mode propagated along said axis, said circuitry having input formations in the shape of discontinuities of said surface, the extent of said discontinuities in the direction of said axis being substantially less than the axial spacing of said grooves.

3,964,071

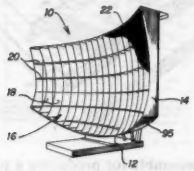
RADAR ANTENNA HAVING A SCREEN SUPPORTED BY SHAPED SLATS

William E. Townes, Jr., Irving, and Stanley P. Svedeman, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 420,196, Nov. 28, 1973, Pat. No. 3,886,557. This application Mar. 11, 1975, Ser. No. 557,442

Int. Cl.² H01Q *15/16*

U.S. Cl. 343—840 **11 Claims**



1. A radar antenna comprising:

a first set of spaced apart parallel flat ribs interlocked with a second set of spaced apart flat ribs, said first and second sets of ribs extending at an angle to one another to form a rigid lattice network, the forward edges of said ribs defining an inwardly contoured support surface for a reflecting surface, and screen means attached to the inwardly contoured support surface for forming an antenna reflector.

3,964,072

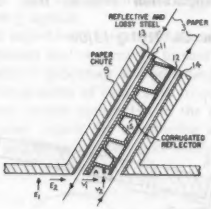
SUPPRESSION OF UNWANTED RADIATION FROM UNAVOIDABLE OPENINGS IN SHIELDED ENCLOSURES

Emery A. White, Charlottesville, Va., assignor to General Electric Company, Waynesboro, Va.

Filed Feb. 25, 1975, Ser. No. 552,989

Int. Cl.² H01P *1/22*

U.S. Cl. 346—146 **6 Claims**



1. In a data processor wherein a record medium in the form of a sheet is required to be moved through an opening in the processor, means for minimizing electromagnetic waves generated within the processor from escaping through said opening comprising an elongated waveguide forming said opening, the cross-sectional width of said waveguide dimensioned to correspond substantially with the width of said medium to maximize overall wave attenuation and to limit propagation of lower frequencies, a wave reflective, lossy material provided along at least the wide surfaces of said waveguide, a reflector included in said waveguide, said reflector comprising a wave reflective sheet of material extending along the length of the waveguide and dimensioned with wave reflecting corrugations along its length, sheets of wave reflective, lossy material positioned adjacent the extremities of the corrugations of said reflector, said corrugations dimensioned in a geometrical pattern to cause repeated multiple reflections of incident waves between the various surfaces of the wave reflective, lossy material.

3,964,073

EXPOSURE CONTROL DEVICES FOR PHOTOGRAPHIC CAMERAS

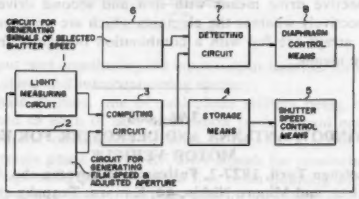
Toshio Kobori, Sakai; Kayoshi Tsujimoto, Osaka; Yasuhiro Nanba, and Seiji Yamada, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 8, 1974, Ser. No. 486,427

Claims priority, application Japan, July 17, 1973, 48-81089

Int. Cl.² G03B *7/14, 7/08*

U.S. Cl. 354—29 **12 Claims**



1. An exposure control device for a photographic camera comprising:

an objective lens;

a diaphragm;

diaphragm controlling means movable from an initial to a terminal position for varying the aperture size of said diaphargm;

manually selectable diaphragm setting means for pre-setting a first position to stop the movement of said diaphragm controlling means;

means for manually selecting shutter speed and for generating an electrical signal representative thereof;

means for measuring the scene light transmitted through said objective lens and diaphragm to produce a light measuring output;

a circuit generating an output signal commensurate with said light measuring output;

automatic diaphragm setting means for determining a second position to stop the movement of said diaphragm controlling means in accordance with said electrical signal and said output signal while said first position is preset by said manual diaphragm setting means, whereby said diaphragm controlling means is stopped at said first position when said first position is closer to said initial position than said second position to be determined and said diaphragm controlling means is stopped at said second position when said second position is determined between said initial position and said first position;

means for storing said output signal prior to the commencement of the exposure; and

means for controlling the shutter speed according to said stored output signal upon exposure.

3,964,074

FLASH UNIT FOR USE WITH CAMERAS HAVING DIFFERENT TYPES OF DIAPHRAGMS AND ACCESSORY SHOES

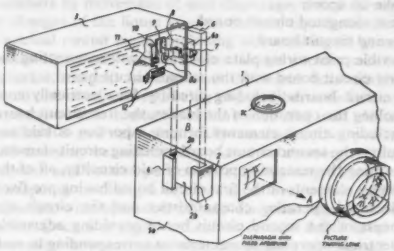
Karl Wagner, Ottobrunn, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed May 29, 1974, Ser. No. 474,430

Claims priority, application Germany, May 30, 1973, 2327584

Int. Cl.² G03B 7/00

U.S. Cl. 354—32 9 Claims



1. The combination of a camera having a fixed diaphragm and an accessory shoe with a source of artificial light including adjustable illuminating means, said illuminating means comprising a photoelectric transducer which is normally exposed to scene light; a foot which is insertable into said shoe; adjusting means for said illuminating means, said adjusting means having a filter and being actuatable by said camera to thereby adjust said illuminating means in automatic response to insertion of said foot into said shoe; and displaceable actuating means for said adjusting means, said actuating means being provided on said foot and being displaceable by said camera in response to insertion of said foot into said shoe, said filter being movable in front of said transducer in response to displacement of said actuating means.

3,964,075

PHOTOGRAPHING APPARATUS

Syohei Ohtaki, Machida; Mithutoshi Ogiso, Kawasaki; Takehiko Kiyohara, Zama, and Taizo Mitani, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

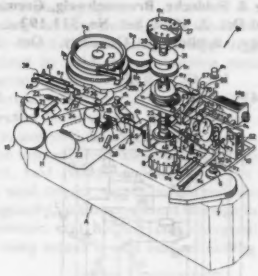
Continuation of Ser. No. 291,211, Sept. 22, 1974, which is a continuation of Ser. No. 31,491, April 24, 1970. This application Oct. 29, 1974, Ser. No. 518,984

Claims priority, application Japan, Apr. 30, 1969, 44-33961; Apr. 2, 1970, 45-28122; Apr. 7, 1970, 45-29219

Int. Cl.² G03B 9/58, 7/08, 19/12

U.S. Cl. 354—51 22 Claims

1. An exposure control system for a camera, comprising shutter means, first control means for operating said shutter means over a predetermined range of shutter times, second control means for causing said first control means to operate said shutter means over a second range outside the first range, changeover means for actuating said second control means and deactivating said second control means, a camera body, said first control means and said shutter means being mounted in said camera body, an adaptor housing removably mounted on said camera body, said second control means and said changeover means being mounted on said housing, viewer means mounted in said housing for viewing the subject to be photographed, first photoelectric indicating means in said body responsive to subjects in one range of brightness and second photoelectric indicating means in said housing responsive to subjects in a second range of brightness, and optical means in said housing responsive to said second control means for displaying the response of said second indicating means in said viewer means when said changeover means actuates said second control means and for displaying the response of said



first control means in said viewer means when said changeover means deactivates said second control means.

3,964,076

SHUTTER SPEED DISPLAY DEVICES FOR ELECTRIC SHUTTER OPERATING CIRCUITS

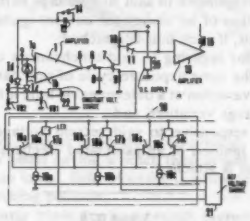
Osamu Ichihashi, Machida, and Sadao Muramatsu, Sagamihara, both of Japan, assignors to Yashica Co., Ltd., Tokyo, Japan

Filed July 11, 1974, Ser. No. 487,850

Claims priority, application Japan, July 27, 1973, 48-89128[U]

Int. Cl.² G03B 7/08

U.S. Cl. 354—51 10 Claims



1. In a shutter speed control and display device including in combination an electric shutter operating circuit for a photographic camera comprising a photosensitive element for producing an electric signal corresponding to the brightness of an object, a first differential amplifier for amplifying said electric signal having the photoelement connected across the input terminals thereof, a second amplifier connected to amplify the output from said first amplifier, a first impedance element connected between one terminal of said photosensitive element and one pole of a DC source of voltage, a second impedance element connected in parallel circuit relationship with the series circuit comprised by said photosensitive element and said first impedance element, and a transistor having its base connected to the output of said second amplifier and its collector connected back to one input of the first amplifier for feeding back the output signal from said second amplifier to the input of said first amplifier for nulling the voltage across the input terminals of said first differential amplifier due to said photosensitive element, wherein said second amplifier comprises a field effect transistor amplifier having respective source and drain resistors, and having the gate electrode thereof connected to the output from said first amplifier, said drain resistor being connected across the base-emitter of said feedback transistor, and shutter speed display means connected across said source resistor.

3,964,077

FLASH SYNCHRONIZING MECHANISM FOR CAMERAS

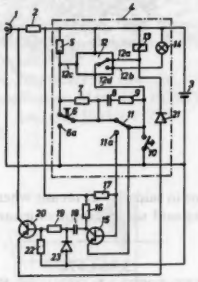
Karl-Peter Strauss, Volkmarode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Oct. 2, 1974, Ser. No. 511,192

Claims priority, application Germany, Oct. 5, 1973, 2350048

Int. Cl.² G03B 15/03

U.S. Cl. 354—141 15 Claims



1. Photographic flash synchronizing mechanism for cameras for selective operation either with a current-ignited combusion flash unit or with an electronic flash unit, comprising

a. means forming a single bi-polar synchronous contact;

b. means for applying to said synchronous contact, during one exposure cycle of a camera, a first voltage variation in predetermined timed relation to the commencement of said exposure cycle;

c. means responsive to said first voltage variation for causing ignition of an associated current-ignited combustion flash unit, if such unit is attached;

d. means for applying to said synchronous contact, during during the same exposure cycle of said camera, a second voltage variation at a determinable time interval after said first voltage variation; and

e. means responsive to said second voltage variation for causing ignition of an associated electronic flash unit, if such unit is attached.

3,964,078

ELECTRO-MECHANICAL ARRANGEMENT IN A SINGLE LENS REFLEX CAMERA HAVING A DETACHABLE BOTTOM COVER PLATE FOR PROVIDING ACCESS TO A CIRCUIT BOARD OF THE ARRANGEMENT

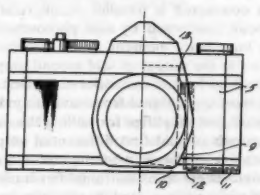
Hiroshi Kurei, Kawagoe, and Keisuke Haraguchi, Kamifukuoka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1974, Ser. No. 519,832

Claims priority, application Japan, Nov. 7, 1973, 48-128103

Int. Cl.² G03B 19/12, 9/28

U.S. Cl. 354—152 1 Claim



1. In a single lens reflex camera having an elongated camera body which includes a detachable longitudinally extending bottom cover plate and which houses a mirror box, a film supply spool and a take-up spool with said spools defining parallel axes that are spaced on opposite longitudinal sides of the mirror box, an electro-mechanical arrangement comprising:

a focal plane shutter of the vertically-operating type comprisng a plurality of blades that are movable relative to each other to define an exposure slit that extends in a direction perpendicular to said axes;

a shutter block comprising a mechanism for directly controlling the mechanical operation of the blades, the shutter block being disposed in the housing adjacent to the take-up spool;

a first, elongated circuit board,

a second circuit board,

a flexible print wiring plate electrically interconnecting the first circuit board with the second circuit board;

the circuit boards including circuitry for electrically controlling the operation of the blades, the first circuit board including circuit elements forming a portion of said circuitry, the second circuit board including circuit elements forming the remaining portion of said circuitry, all of the circuit elements of the first circuit board having pre-fixed electrical operating characteristics and the circuit elements of the second circuit board providing adjustable electrical operating characteristics corresponding to variable photographic factors, the first circuit board being disposed in the housing so as to extend longitudinally in parallel with said axes at a position between the mirror box and the film supply spool, and the second circuit board being disposed in the housing between the film supply spool and the detachable cover plate so as to be readily accessible.

3,964,079

BRAKE FLUID RESERVOIR INCLUDING FLUID LEVEL INDICATOR

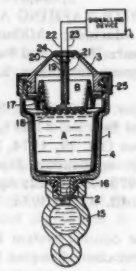
Masayoshi Katagiri, and Jiro Kizaki, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Mar. 25, 1975, Ser. No. 561,688

Claims priority, application Japan, Aug. 28, 1974, 49-97968

Int. Cl.² G08B 21/00

U.S. Cl. 340—244 E 2 Claims



1. A fluid reservoir particularly suited for containing brake fluid of a vehicle comprising container means, diaphragm means separating said container means into a liquid chamber and a vapor chamber, means mounting said diaphragm means to move in accordance with the quantity of liquid contained within said liquid chamber, an elongated rod having a portion of its length composed of electrically conductive material and another portion of its length composed of electrically nonconductive material, said rod being mounted at one end thereof for movement together with said diaphragm means, a pair of generally elongate contact members both composed of electrically conductive material fixed relative to said container means and extending generally along the direction of mo:e-

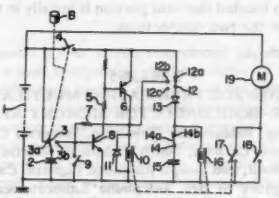
ment of said diaphragm means alongside said rod on opposite sides thereof, a contact portion on each of said contact members each located on an opposite side of said rod and engaging said rod therebetween in sliding abutment therewith, slot means defined in each of said contact members and extending therealong in the general direction of movement of said diaphragm means, a stop member affixed to said rod extending to within said slot means and adapted to slide therealong as a result of relative movement between said rod and said contact members, said stop member being arranged to abut the ends of said slot means to limit the degree of relative movement which may be effected between said rod and said contact members by movement of said diaphragm means in response to changes of the liquid level within said liquid chamber, and electrical circuit means including electrical signal generating means electrically connected across said contact members to generate a signal indicative of the liquid level within said liquid chamber, said rod being engaged between said contact portions of said contact members such that said electrically conductive and said electrically nonconductive portions of said rod may be individually placed in abutting relationship between said contact portions as said diaphragm means moves in response to changes of said liquid level within said liquid chamber, with operation of said electrical signal generating means to emit a signal indicative of said liquid level being controlled in accordance with the portion of said rod in engagement between the contact portions of said contact members.

3,964,080

ELECTROMAGNETIC TRIGGER DEVICE IN A CAMERA CAPABLE OF EFFECTING TIME PHOTOGRAPHY

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 17, 1975, Ser. No. 542,083
Claims priority, application Japan, Jan. 22, 1974, 49-8947
Int. Cl.² G03B *9/08, 21/38, 17/38*
U.S. Cl. 354—234 **27 Claims**



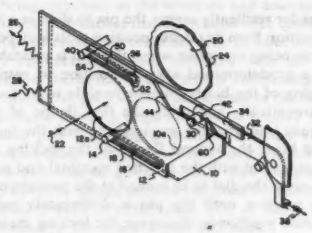
1. An electromagnetic trigger device in a camera capable of effecting time photography, said device comprising:
   1. a trigger switch;
   2. an electrical power source;
   3. a shutter driving mechanism;
   4. a motor for rotating the shutter driving mechanism;
   5. restraining means movable between a restraining position and a non-restraining position, said restraining means being adapted, when in said restraining position, to restrain said shutter driving mechanism in fully closed shutter position and in fully open position;
   6. a motor switch adapted to be closed to connect the power source to said motor when said restraining means is in said non-restraining position;
   7. an actuating coil energized to attract said restraining means for a predetermined time interval when said trigger switch is closed, said coil moving said restraining means to said non-restraining position upon energization of said coil, said predetermined time being shorter than the shorter of the time required for said shutter driving mechanism to move from the fully closed shutter position to the fully open shutter position and the time required for said shutter driving mechanism to move from the fully open shutter position to the fully closed shutter position;
   8. a selector member for selecting continuous photography and time photography;
   9. a holding coil responsive, when the continuous photography is selected, to closing of said trigger switch to be energized to hold said restraining means in said non-restraining position; and
   10. a current generating circuit including a timing switch connected between said trigger switch and said power source, said switch being adapted to be opened for a part of time interval from fully opening to fully closing of the shutter, said current generating circuit being adapted, when said trigger switch is opened during continuous photography, to flow a current through said timing switch to maintain said holding coil energized and hold said restraining means in said non-restraining position.

3,964,081

ANTI-BOUNCE SHUTTER

Charles E. Pickering, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,940
Int. Cl.² G03B *9/40*
U.S. Cl. 354—246 **3 Claims**



1. In a camera, shutter apparatus, comprising:
   a first shutter blade having a notch therein and being movable from an initial, light blocking position to a terminal, light unblocking position;
   a second shutter blade having a notch therein and being movable from an initial, light unblocking position to a terminal, light blocking position;
   means for moving said first and second shutter blades from said initial to said terminal positions; and
   a pin disposed in the path of movement of the first and second blade and being located to engage the notches upon arrival of the blades at the light unblocking position and blocking positions respectively to arrest the motion thereof.

3,964,082

CAMERA AUTO/MANUAL EXPOSURE CONTROL SELECTOR DIAL ASSEMBLY

Kunio Mita, Kamifukuoka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

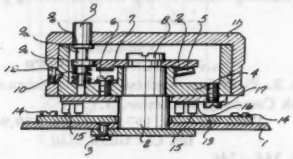
Filed Nov. 20, 1974, Ser. No. 525,459
Claims priority, application Japan, Nov. 21, 1973, 48-133693[U]
Int. Cl.² G03B *17/00*
U.S. Cl. 354—289 **2 Claims**

1. A selector dial assembly in a camera that is operable in either an automatic exposure control mode or a manual mode in accordance with a setting of the dial assembly, wherein the selector dial assembly comprises:
   an indicator dial, and means for rotatably supporting it on the camera body, the indicator dial having a hole radially

spaced from its axis of rotation, and a surface with exposure setting indicia thereon;

a stationary member having a notched marginal end portion, and means for affixing the stationary member to the camera body with the notched marginal end portion radially spaced from said axis of rotation;

an elongated pin including an end portion and a locking means portion, the locking means portion including first and second axially spaced-apart flanges and a reduced diameter portion therebetween, the pin having a lock position and a release position and being slidably engaged in the hole so that it can slide between its lock and release positions, the end portion of the pin being positioned out of the hole when the pin is in its lock position so as to be accessible to be manually pushed to force the pin toward its release position;



means for resiliently urging the pin to slide in a longitudinal direction from its release position to its lock position; and

the pin being operative when the dial is rotatably oriented at a predetermined angular position to respond to the urging of the biasing means to slide to its lock position. automatically and bring the first flange of the locking means into abutting engagement with the indicator dial and bring the second flange of the locking means into engagement with the notched marginal end portion so as to cause the dial to be locked at the predetermined angular position until the pin is deliberately pushed to its release position to disengage the locking means from the notched marginal end portion to enable manual rotation of the dial.

3,964,083

PUNCHTHROUGH RESETTING JFET IMAGE SENSOR

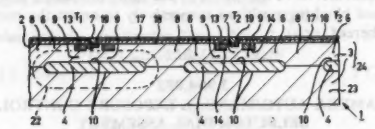
Jan Lohstroh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,694

Claims priority, application Netherlands, June 14, 1973, 7308240

Int. Cl.² H01L 27/14, 31/00, 29/80

U.S. Cl. 357—30 **13 Claims**



1. A semiconductor imaging device, comprising a common semiconductor body comprising an array of plural field effect transistors each having a first gate electrode, a source region and a drain region of one type conductivity adjoining the first gate electrode and defining therebetween a one type conductivity channel region, said first gate electrode comprising a zone of the opposite type conductivity forming a photosensitive p-n junction with the channel region, said first gate zones being electrically floating, some of said field effect transistors having different threshold voltages, and means for electrically charging the first gate zones of each transistor to a reverse potential substantially equal to its threshold voltage producing a depletion region extending from the photosensitive p-n junction in each transistor that just blocks the channel region, whereby the absorption of substantially equal quantities of radiation by each transistor will cause substantially the same change in conduction of its channel.

3,964,084

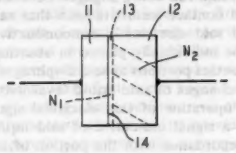
SCHOTTKY BARRIER DIODE CONTACTS

John Marshall Andrews, Jr., South Whitehall, PA; Robert Morgan Ryder, Summit, and Simon Min Sze, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 12, 1974, Ser. No. 478,506

Int. Cl.² H01L 29/48, 29/56, 29/64

U.S. Cl. 357—15 **5 Claims**



1. A semiconductive device which comprises a semiconductive member and a pair of electrode connections thereto defining a path of current flow therebetween through said member of which at least one of the connections forms in the member in the path of current flow both a rectifying barrier and an internally generated depletion layer characterized in that said one connection contacts a region of the semiconductive member which has along the path of current flow a thickness smaller than the thickness of the internally generated depletion layer and also has a carrier concentration at least ten times that of the portion of the member adjacent said region in the path of current flow, and the other of said connections is so located that said portion is serially in the current path between the two connections.

3,964,085

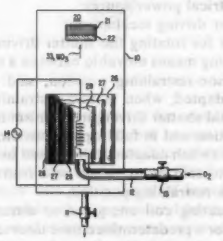
METHOD FOR FABRICATING MULTILAYER INSULATOR-SEMICONDUCTOR MEMORY APPARATUS

Dawon Kahng, Bridgewater Township, Somerset County; Ernest Edward La Bate, South Plainfield; Martin Paul Lepselter, Summit, and Joseph Raymond Ligenza, Califon, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 18, 1975, Ser. No. 605,312

Int. Cl.² H01L 11/00, 15/00; B05D 5/12

U.S. Cl. 357—23 **16 Claims**



1. A semiconductor-insulator$_1$-insulator$_2$ layered structure made by a process which includes the step of depositing an oxide of a metallic impurity on the then exposed surface of the insulator$_1$ layer, prior to the fabrication of the insulator$_2$ layer,

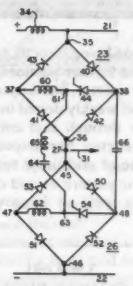
in an amount yielding between about 10^{14} and 4×10^{15} metallic impurity nuclei per square centimeter.

5. In a method for fabricating a memory apparatus comprising a semiconductor insulator$_1$-insulator$_2$-metal layered structure which contains metallic impurities in a predetermined molecularly dispersed surface concentration, without clumping which would form a Fermi level of the metallic impurities, in an interface insulator region (including the interface of the insulator layers), said impurities in a concentration supplying suitable states for the capture of electronic charges in said region, the step of depositing molecules of an oxide of the metallic impurity on the then exposed surface of the insulator$_1$ layer in an amount yielding said surface concentration of metallic impurities.

3,964,086
COMPLEMENTARY COMMUTATION CIRCUIT FOR BIPOLAR INVERTER

David James Gritter, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1975, Ser. No. 591,364
Int. Cl.[2] H02M 7/515
U.S. Cl. 321—45 R 4 Claims



1. A bipolar power conversion circuit capable of passing energy to a load irrespective of the polarity of an energizing potential difference applied to a pair of bus conductors over which the power conversion circuit is energized, in which each leg of the power conversion circuit comprises:

a first power switch, coupled between one of the bus conductors and a load connection, including a pair of load terminals, a pair of switching terminals, four diodes connected to conduct current between the load terminals when a d-c circuit is completed between the switching terminals, and a first thyristor connected to complete the d-c circuit as it is gated on;

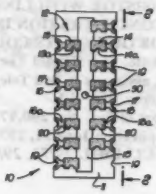
a second power switch, coupled between the load connection and the other bus conductor, including a pair of load terminals, a pair of switching terminals, four diodes connected to conduct current between the load terminals when a d-c circuit is completed between the switching terminals, and a second thyristor connected to complete the d-c circuit as the thyristor is gated on; and

a complementary commutation circuit, including a first inductor, coupled in series with the first thyristor between the switching terminals in the first power switch, a second inductor, coupled in series with the second thyristor in the second power switch, a first capacitor, with one plate coupled to the common connection between the first thyristor and the first inductor, and the other plate coupled to the common connection between the second thyristor and the second inductor, and a second capacitor, coupled between one switching terminal of the first power switch and one switching terminal of the second power switch, which complementary commutation circuit is effective to turn off the conducting one of the first and second thyristors when the other of the thyristors is gated on.

3,964,087
RESISTOR NETWORK FOR INTEGRATED CIRCUIT

Marvin C. Mallon, Canoga Park, Calif., assignor to Interdyne Company, Van Nuys, Calif.

Filed May 15, 1975, Ser. No. 577,725
Int. Cl.[2] H01C 7/00
U.S. Cl. 338—306 14 Claims



1. An electrical resistance package comprising

a. an insulative substrate,

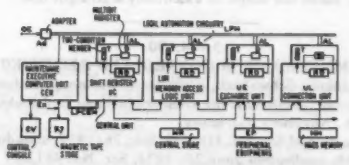
b. a network in film form on the substrate, the network including resistance branches,

c. there being terminals on the substrate and associated with the respective branches for registration with contact pins, whereby the resistance branches may be selectively electrically connected via said terminals with the pins in registration therewith, said terminals comprising electrically conductive pads located at the ends of the branches, the substrate forming edge notches to receive the pins and each pad extending proximate a notch edge but everywhere offset therefrom away from the notch edge so as to remain out of direct contact with the pin in the notch, whereby means may be received on selected pins to closely overlie selected pads and to have soldered connections to the selected pins and pads.

3,964,088
MULTI-UNIT EQUIPMENT MAINTENANCE SYSTEM

Claude Ducrocq, Le Pecq; Robert Hacques, Plaisir; Maurice Hubert, Versailles, and Robert Touze, Noisy-le-Roi, all of France, assignors to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Dec. 16, 1974, Ser. No. 533,458
Claims priority, application France, Dec. 27, 1973, 73.46458
Int. Cl.[2] G06F 11/00
U.S. Cl. 340—172.5 10 Claims



1. In an information handling system comprising a plurality of diversified processing units interconnected by normal data paths, one of said units being a maintenance and diagnostic signal source and data processing station which is connected by a special data exchange communication link to the other processing units, each processing unit other than said station having internal means responsive to error and failure detections, the combination in each of the processing units interconnected by said special link and station of;

shift registers, each one connectable to said link and each comprising a hard wired series connection of multi and single bit members at least some of which are functional in the unit and others which copy the conditions of functional members of the unit, and

automaton circuit means responsive to command signals from the said station and from said error and failure detection means for controlling the actuation of said shift registers for write-in and read-out operations thereof.

3,964,089

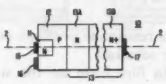
JUNCTION TRANSISTOR WITH LINEARLY GRADED IMPURITY CONCENTRATION IN THE HIGH RESISTIVITY PORTION OF ITS COLLECTOR ZONE

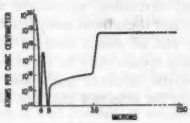
Hin-Chiu Poon, Gillette, and Donald Lee Scharfetter, Mendham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 290,976, Sept. 21, 1972, abandoned. This application June 11, 1975, Ser. No. 586,056

Int. Cl.² H01L *29/72, 29/167*

U.S. Cl. 357—34 **6 Claims**





1. A transistor comprising a semiconductive wafer including emitter, base and collector zones, the collector zone comprising a relatively lightly doped portion adjacent the base zone and a relatively heavily doped portion spaced from the base zone by said relatively lightly doped portion characterized in that over at least half of its thickness the lightly doped portion has a substantially linearly graded impurity concentration appropriate for reducing the nonlinearity of the cutoff frequency characteristic of the transistor, and the profile of concentration versus thickness, when plotted on rectangular coordinates having linear scales for both ordinate and abscissa, takes the shape of essentially a straight line.

3,964,090

SEMICONDUCTOR CONTROLLED RECTIFIER

Gunter Jakob, Schwabach, Eichwasen, Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau und Elektronid m.b.H., Nurnberg, Germany

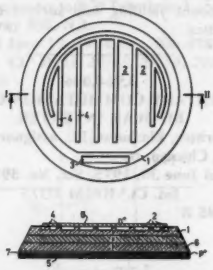
Continuation of Ser. No. 318,409, Dec. 26, 1972, abandoned. This application June 20, 1974, Ser. No. 481,317

Claims priority, application Germany, Dec. 24, 1971, 2164644

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **7 Claims**

1. In a semiconductor controlled rectifier having a semiconductor body with a planar outer surface and at least four zones of alternatingly opposite conductivity types including an outer highly doped emitter zone of a first conductivity type at said outer surface and an adjacent inner weakly doped zone of the opposite conductivity bordering the outer emitter zone and having a first portion which extends to said outer surface adjacent said emitter zone and further portions which extend through said outer emitter zone up to said outer surface completely within the perimeter of said emitter zone at said outer surface, said first portion being separated from said further portions at said outer surface by said emitter zone, a control electrode disposed on said outer surface and contacting said first portion of said weakly doped inner zone, and a conductive coating disposed on said outer surface over said emitter zone and serving as a single emitter contact electrode, said



single contact electrode being directly connected to said emitter zone and only said further portions of said inner zone so as to form a shorted emitter, the improvement wherein said further portions of said weakly doped inner zone which extend to said outer surface through said emitter zone comprise a plurality of interconnected bar-shaped sections, which are elongated in the plane of said outer surface, and which form a connected geometric pattern at said outer surface, whereby a controlled rectifier with an improved dv/dt behavior is achieved.

3,964,091

TWO-WAY SEMICONDUCTOR SWITCH

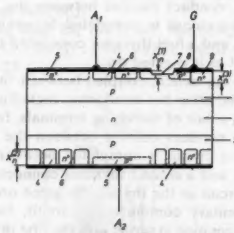
Günter Berndes, Heppenheim, and Horst Krassin, Hemsbach, both of Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 11, 1974, Ser. No. 514,101

Claims priority, application Germany, Oct. 16, 1973, 2351783

Int. Cl.² H01L *29/747*

U.S. Cl. 357—39 **1 Claim**



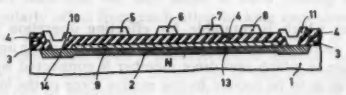
1. In a two-way semiconductor switch comprising a semiconductor body structure having at least five superposed zones alternating in conductivity types, the three inner zones forming the basic interior structure, and the two outer zones each of which includes subzones of different conductivity types located at the opposite end faces of the semiconductor body forming the emitter and anode boundary zones respectively and one of an n-p-n-p-structure and a p-n-p-n-structure together with the three inner zones, the outer zones having a main electrode in ohmic contact therewith and one end face

of said semiconductor body including means providing first and second control zones of different conductivity types and in ohmic contact with a control electrode common to both control zones, the improvement wherein the penetration depth of said second control zone and the penetration depth of the part of the outer zone at the opposite end of said semiconductor body structure having the same type of conductivity as said second control zone are made greater than the penetration depth of the part of the outer zone of the same type of conductivity at the end face at which said second control zone is located, and a greater emitter short-circuit density is provided at the main electrode in contact with said opposite end face than at the other main electrode, thereby to maintain commutation stability.

3,964,092
SEMICONDUCTOR DEVICES WITH CONDUCTIVE LAYER STRUCTURE

Eric Wadham, Winchester, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,583
Claims priority, application United Kingdom, Nov. 23, 1973, 54392/73
Int. Cl.² H01L *19/00*
U.S. Cl. 357—68 **12 Claims**



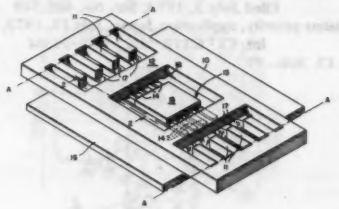
1. A semiconductor device, in particular an integrated circuit, comprising:
   a. a semiconductor body comprising an insulating layer present on a surface thereof,
   b. at least a first electric connection comprising a first conductive layer extending over said insulating layer, and
   c. a second electric connection present at least partly below said first connection, said second connection crossing said first connection and being electrically insulated therefrom, said second electric connection comprising a second conductive layer that comprises a first component layer in the form of semiconductor material which is locally deposited on said body surface and is doped with an impurity and a second component layer formed by a surface region of said body underlying said first component layer, said second component layer beind doped with said impurity introduced into said body via the first component layer.

3,964,093
BONDING OF DISSIMILAR WORKPIECES TO A SUBSTRATE

Alexander Coucoulas, Bridgewater Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 413,006, Nov. 5, 1973, Pat. No. 3,914,850. This application July 15, 1974, Ser. No. 488,860
Int. Cl.² H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 357—70 **2 Claims**

1. A lead frame for the fabrication of an article of manufacture, said article comprising a substrate and first and second leads bonded to first and second sites, respectively, on said substrate, said second lead initially being an integral part of said lead frame and said first lead not forming a portion thereof, said lead frame further comprising:
   a support member having integral therewith:
      a. a compliant bonding portion having a surface thereof for engagement with said first lead for the compliant bonding of said first lead to said first site when pressure is applied to said first lead through said bonding portion, said bonding portion being of a material softer than said first lead, and said bonding portion surface being of a bond inhibiting material so as not to adhere to said first lead or said substrate during the bonding operation; and
      b. a second portion comprising said second lead projecting from said support member;
   said lead frame being configured to enable engagement of said compliant bonding portion with said first lead and

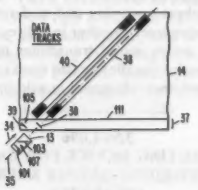


   the simultaneous engagement of a portion of said second portion with said second site on said substrate for the simultaneous bonding of said first and second leads to said first and second sites, respectively; and
   said second portion being detachable from the remainder of said frame including said compliant bonding portion to provide said second lead after the bonding of said leads to said substrate and to provide said article upon detachment and removal of said remainder of said frame therefrom.

3,964,094
SERVO INFORMATION PATTERN FOR ROTATING HEAD MAGNETIC TAPE UNIT INDEPENDENT OF AMPLITUDE

Gary Allen Hart, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,722
Int. Cl.² G11B *21/10, 21/04*
U.S. Cl. 360—77 **20 Claims**



1. In a rotating head magnetic tape unit wherein a head wheel is being positioned to rotate in space relationship between upper and lower mandrel halves, the improvement in combination comprising:
   a length of magnetic media helically wrapped about said upper and lower mandrel halves, said length of magnetic media having servo track and data track thereon;
   said servo track including a servo format having first flux transition being parallel to the longitudinal edge of the magnetic media and second flux transition being inclined to said first flux transition and being parallel to said data track flux transitions;
   a single reading means operably associated with said magnetic media for reading the servo track to derive head/-track alignment time dependent data and reading the data track for information data; and

detection means operably connected to said reading means for receiving the time dependent information and using said time dependent information for proper head track alignment.

3,964,095

VIDEO RECORDING AND/OR REPRODUCING APPARATUS

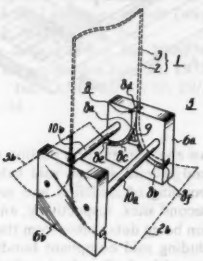
Nobutoshi Kihara, and Osamu Shimada, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,549

Claims priority, application Japan, July 11, 1973, 48-78600

Int. Cl.² G11B 5/52, 5/80, 21/04

U.S. Cl. 360—81 20 Claims



1. An apparatus for recording and/or reproducing at least video signal information on a sheet assembly including at least two flexibly resilient sheets kept oriented and aligned with respect to each other and normally disposed in closely adjacent, confronting relation, said apparatus comprising: separator means for receiving said sheet assembly and separating only a substantial portion of each of said sheets from the other of said sheets; a guide drum; guiding means for receiving the separated portion of one of said sheets from said separator means and guiding said separated portion of said one sheet in an arcuate path about at least a portion of the circumference of said drum; rotary signal transducer means associated with said guide drum for movement in a circular path substantially coinciding with said circumference of the drum; and means for moving said sheet assembly and said rotary signal transducer means relative to each other in a direction transverse to said path of the rotary signal transducer means so that the latter scans successive parallel record tracks on said separated portion of said one sheet disposed in said arcuate path.

3,964,096

CASSETTE EJECTING DEVICE FOR CASSETTE-TYPE VIDEO RECORDING AND/OR REPRODUCING APPARATUS

Atsuo Matsuyama, Machida, Japan, assignor to Sony Corporation, Tokyo, Japan

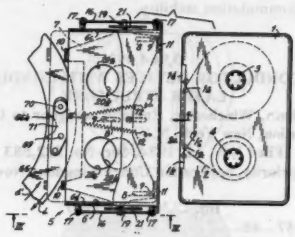
Filed Dec. 2, 1974, Ser. No. 528,691

Claims priority, application Japan, Nov. 30, 1973, 48-135157

Int. Cl.² G11B 23/08, 15/66, 5/78

U.S. Cl. 360—85 13 Claims

1. In a cassette-type recording and/or reproducing apparatus that includes a tape guide drum with at least one rotary magnetic head moved in a circular path substantially coinciding with the periphery of said drum, a cassette holding device spaced from said drum and having a holder displaceable between a first position at which a tape cassette is insertable in, and removable from said holder and a second position at which the cassette in said holder is operatively positioned, a tape loading and unloading device operative, in a loading operation thereof, to withdraw tape from the operatively positioned cassette and wrap the withdrawn tape about at least a portion of the periphery of said guide drum for scanning by each said rotary head and, in an unloading operation, to unwrap the tape from said guide drum and return the tape to the operatively positioned cassete, and a motor which is energizable for operating the apparatus: the combination of motor control means for initiating the energizing of said motor upon the displacement of said holder to said second position and continuing said energizing of the motor until said holder is returned to said first position; and a cassette ejecting device comprising holder displacing means operative to return said holder from said second position to said first position, a drive



member which is rotatable for effecting operation of said holder displacing means, transmission means having an operative state in which said drive member is connected with said motor so as to be rotated by the motive force of the latter for operating said holder displacing means and an inoperative state in which said drive member is disconnected from said motor, and control means responsive to a condition of said tape loading and unloading device for permitting establishment of said operative state of the transmission means only when the condition of said tape loading and unloading device corresponds to that at the completion of said unloading operation thereof.

3,964,097

MULTI-CARTRIDGE APPARATUS FOR RECORDING AND REPRODUCING AUDIO SIGNALS AUTOMATICALLY AND SUCCESSIVELY

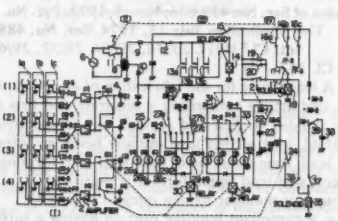
Tamio Kobayashi, Hirakata, and Tadashi Torama, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 18, 1973, Ser. No. 425,796

Claims priority, application Japan, Dec. 30, 1972, 48-3963; Dec. 30, 1972, 48-3964; Dec. 30, 1972, 48-3965; Dec. 30, 1972, 48-3966; Dec. 30, 1972, 48-3967; Dec. 30, 1972, 48-3968; Dec. 30, 1972, 48-3969; Dec. 30, 1972, 48-3970; Dec. 30, 1972, 48-3971; Dec. 30, 1972, 48-3972; Dec. 30, 1972, 48-3973; Dec. 30, 1972, 48-3974; Dec. 30, 1972, 48-3975; Dec. 30, 1972, 48-3976

Int. Cl.² G11B 15/68

U.S. Cl. 360—92 13 Claims



1. An apparatus for recording and reproducing audio signals

automatically and successively from a plurality of cartridges, comprising:

cartridge receiving means having a plurality of spaces defined by at least one partition wall provided between upper and lower base plates, each space receiving one cartridge therein;

transducing head means and cartridge sensing switch means mounted in each cartridge receiving space;

bias means mounted in each cartridge receiving space for normally urging a cartridge in a cartridge receiving space out of engagement with the corresponding transducing head means and sensing switch means;

cartridge moving means mounted in each cartridge receiving space for selectively moving a cartridge in that space into an operating position in contact with the corresponding transducing head means and against the force of said bias means, said cartridge moving means including a locking lever pivotally mounted for movement in the corresponding cartridge receiving space and having a lock roller mounted at one end portion for engagement with a recess in the corresponding cartridge, means coupled to said lock lever for urging the lock lever in a direction of movement such that said lock roller contacts said cartridge, a locking cam having a cam slope which contacts the other end portion of said locking lever, each locking cam being mounted on a common control cam shaft such that the cam slope of each locking cam is angularly offset from each other locking cam slope; and

control means coupled to said control cam shaft to rotate said cam shaft upon a predetermined control signal to selectively control the movement of said cartridges into and out of engagement with their corresponding transducing head means.

3,964,098

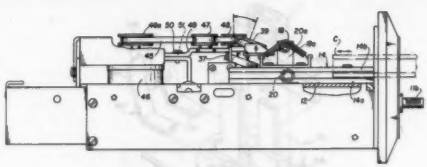
TAPE DECK WITH DRIVE MOTOR REMOTE FROM DRIVE ROLLER

Joel Kramer, Woodbury; David Fialkow, Farmingdale, and W. Sterling Gorrill, Manhasset, all of N.Y., assignors to North Atlantic Industries, Inc., Plainview, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,045

Int. Cl.² G11B *15/28*

U.S. Cl. 360—93 **15 Claims**



1. A tape deck mechanism for accommodating and actuating record tapes in cartridges having at least one external positioning reference plane, an input capstan and means to expose sequential sections of the tape to a transducer, comprising a cartridge housing, positioning reference means to engage the reference plane of the inserted cartridge, means to releasably secure the cartridge on the reference means, a drive roller to engage the capstan in the cartridge, a yieldable support for the drive roller to maintain driving relationship with the capstan of an inserted cartridge, a drive motor remote from the drive roller, and an endless belt coupling the motor to the roller, the limbs of the belt which drive the roller being oriented at substantially right angles to the direction of movement of the support for the roller when the roller and capstan are in driving engagement.

3,964,099

CASSETTE ADAPTER

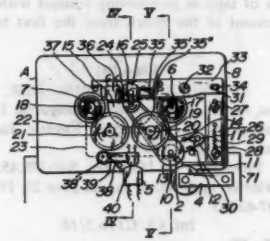
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 5, 1974, Ser. No. 476,720

Claims priority, application Japan, June 6, 1973, 48-66863[U]; Sept. 19, 1973, 48-109457[U]; Dec. 29, 1973, 49-3548

Int. Cl.² G11B *23/04*

U.S. Cl. 360—94 **9 Claims**



1. A cassette adapter for tape recorders using relatively large conventional cassettes, the tape recorder including a first capstan shaft with a first pinch roller as well as first delivery and take-up reels, the adapter being substantially equal in size to the large cassettes and being capable of mounting thereon relatively small cassettes, to be played on the tape recorder through the intermediary of the adapter, the small cassette including second delivery and take-up reels, the adapter comprising: a second capstan shaft, a second pinch roller associated with the second capstan shaft, a first power-transmission mechanism for driving the second capstan shaft from said first capstan shaft; a second power-transmission mechanism for selectively driving said second delivery and take-up reels from at least one of said first delivery and take-up reels; and means for moving an operating mechanism into a condition for reproducing recording on the small cassette, said operating mechanism including a first magnetic head for the adapter and said second pinch roller, by means of a reproduction operating member on the tape recorder.

3,964,100

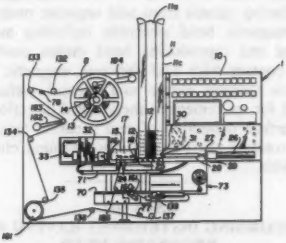
AUTOMATIC TAPE LOADING APPARATUS FOR CASSETTES AND THE LIKE

William P. Bennett, and Jacob Haller, both of Northbrook, Ill., assignors to Programming Technologies, Inc., Chicago, Ill.

Division of Ser. No. 296,255, Oct. 10, 1972, Pat. No. 3,814,343. This application May 29, 1974, Ser. No. 474,238

Int. Cl.² G11B *15/00*

U.S. Cl. 360—95 **10 Claims**



1. An apparatus for automatically positioning a section of tape or the like on a surface comprising, in combination, a housing having an internal chamber open along one side, an entrance passage for receiving a loop of said tape into said chamber, and at least one outlet port in communication with said chamber; a block having a surface for receiving a section of said tape movable into a first position to sealably engage the

open side of the housing to enclose the internal chamber and into a second position out of engagement with the housing; and a vacuum source connected to the outlet port to reduce the pressure within the chamber to create a suction force to act upon the tape introduced via the entrance passage in a manner such that the tape forms a loop conforming in shape to the internal configuration of the chamber with one section of said loop in contact with the surface of the block; said block having a plurality of passages formed therein connecting the tape receiving surface and the vaccuum source to hold said one section of tape in nonmoving contact with said surface upon movement of the block from the first to the second position.

3,964,101

MAGNETIC RECORDING DISC

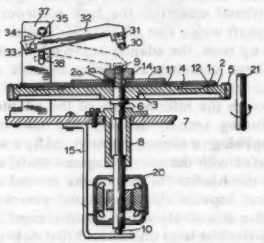
Tetsuo Hino, Osaka, and Susumu Hashiguchi, Izumi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 15, 1973, Ser. No. 370,453

Claims priority, application Japan, June 20, 1972, 47-62230; 47-62231; 47-62233

Int. Cl. G11b *5/16*

U.S. Cl. 360—99 **5 Claims**



1. A magnetic recording apparatus comprising:

a rotating disc adapted to be rotated by a driving means, said rotating disc having a first surface and a second surface indented from said first surface;

a flexible sheet mounted on said first surface of said rotating disc and extending over said first surface and above said second surface of said rotating disc;

a separate magnetic sheet readily separable from and mounted on said flexible sheet;

means attachable to said rotating disc for holding at least a part of said separate magnetic sheet together with said flexible sheet on said rotating disc over said first surface, whereby said separate magnetic sheet and said flexible sheet rotate with said rotating disc; and

a magnetic head assembly for recording signals on and reproducing signals from said separate magnetic sheet, said magnetic head assembly including magnetic recording and reproducing head means positionable in close contact with said separate magnetic sheet at a position thereon above said second surface and arranged for movement in the vertical direction to follow any surface deflection of said separate magnetic sheet upon rotation thereof while maintaining close contact therewith.

3,964,102

DATA RECORDING INSTRUMENT HAVING A MOVING RECORDING HEAD

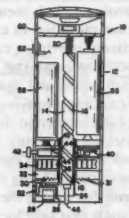
James D. Holder, 707 Graycroft Drive SW., Huntsville, Ala. 35802

Filed Dec. 23, 1974, Ser. No. 535,340

Int. Cl.[2] G11B *5/82, 25/04, 21/04*

U.S. Cl. 360—101 **6 Claims**

1. A data recording instrument for recording information on a magnetic disc having a center cup therein, said instrument comprising: a case; means to ready the instrument for use and position a record/play head to its starting position; said means including an elongated body disposed centrally within said case, a coaxial spring connected to said case and said body to suspend the body, a helical groove on the outer surface of said body and a center point at its other end; an armature including a cylindrical portion enclosing said body; a runner pin attached to said cylindrical portion and engaging said helical groove, said armature further including a mounting plate and



a record/play head attached to said plate; a bulkhead having a spiral cut groove thereon and disposed above said mounting plate; a guide pin attached to said mounting plate and engaging said spiral cut groove; a drive spring disposed around said armature cylindrical portion, said spring having one end attached to said cylindrical portion and its other end attached to said case, and a regulator means connected to said drive spring to control rotation of the armature and move the record/play head in a manner to erase previous messages and record new ones or to play a previous message.

3,964,103

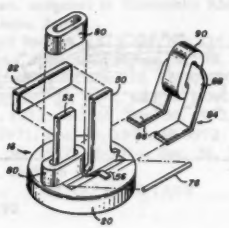
MAGNETIC TRANSDUCER WITH TRIM ERASE AND HOUSING THEREFOR

Herbert E. Thompson, and David A. Brown, both of Los Gatos, Calif., assignors to Shugart Associates, Inc., Sunnyvale, Calif.

Filed May 19, 1975, Ser. No. 578,649

Int. Cl.[2] G11B *5/105, 5/27, 5/42*

U.S. Cl. 360—129 **7 Claims**



1. A magnetic head assembly comprising:

a generally cylindrical housing having a tapered portion at one end thereof terminating in a circular aperture having an inner diameter;

a circular body forming a slider having an outer diameter slighly less than said inner diameter, a media engaging surface and an internal surface, said body further having a first elongated slot disposed along a first diameter and extending through said body, a second slot disposed along a second diameter normal to said first diameter and extending part way into said body from said internal surface and across said first slot, and a central aperture extending through said body at the intersection of said first and

second slots, said body being disposed within said circular aperture and affixed to said housing;

first means forming a read/write transducer having a pair of read/write pole pieces separated to provide a read/write gap, said read/write pole pieces extending into said first slot to a point substantially flush with said media engaging surface, said read/write gap being positioned within said central aperture;

second means forming an erase transducer and including a pair of erase pole pieces disposed in said second slot, one on each side of said first slot, the ends of said erase pole pieces nearest said read/write pole piece extending into said central aperture to a point proximate said media engaging surface, said erase pole pieces being separated from said read/write pole pieces to form first and second erase gaps; and

means bonding said slider, said read/write transducer and said erase transducer together.

3,964,104

INTERMITTENT CLEANER FOR ROTATING MAGNETIC HEAD

Christopher C. Herron, and Clyde R. Williams, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,889

Int. Cl.² G11B *5/41*; **A47L** *25/00*

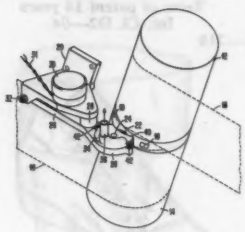
U.S. Cl. 360—128 **9 Claims**

1. Apparatus for cleaning a magnetic head mounted on a rotor in a rotating-head magnetic tape recorder comprising:

an idler brush wheel rotatably mounted about a shaft and having bristles in contact with the rotor carrying the magnetic head;

said shaft of said idler brush wheel mounted relative to the rotor so that the rotor penetrates into the brush causing the bristles of the brush to flex and brush dirt from the surface of the rotor;

means for driving the rotor during the cleaning operation



whereby the drive of the rotor in contact with the rotatably mounted idler brush wheel causes said idler brush wheel to rotate;

the axis of said rotor and the axis of said idler brush wheel having an acute angle therebetween whereby the rotary motion of the rotor and said idler brush wheel create a brushing action across the surface of the rotor and the head carried by the rotor.

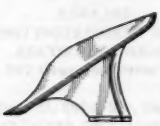
DESIGNS

JUNE 15, 1976

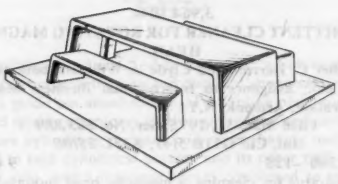
240,280
SPORT SHOE
Jonas Senter, Greenwich, Conn., assignor to CITC Industries Inc.
Filed Oct. 15, 1974, Ser. No. 515,033
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

240,281
BOOT SOLE
Robert E. Russell, Holden, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed Mar. 21, 1975, Ser. No. 560,807
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

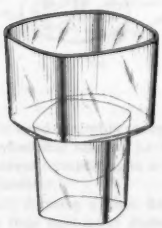
240,282
HEEL OF A SHOE
Jack Horowitz, 48—53 208th St., Bayside, N.Y. 11364, and Arthur Goldman, 67—66 108th St., Forest Hills, N.Y. 11375
Filed July 19, 1974, Ser. No. 489,911
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—325



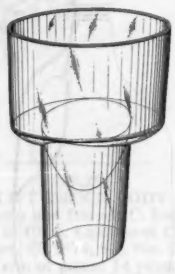
240,283
COMBINED PICNIC TABLE AND MULTIPLE BENCH UNIT
James E. Miller, Birmingham, Mich. (12900 W. Ten Mile Road, South Lyon, Mich. 48178)
Filed July 5, 1974, Ser. No. 485,849
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45



240,284
DRINKING GLASS
Timo Tapani Sarpaneva, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Iittala, Finland
Filed Aug. 26, 1974, Ser. No. 500,655
Claims priority, application Finland Feb. 25, 1974
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—11



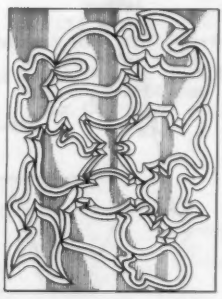
240,285
DRINKING GLASS
Timo Tapani Sarpaneva, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Iittala, Finland
Filed Aug. 26, 1974, Ser. No. 500,658
Claims priority, application Finland Feb. 25, 1974
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—11



240,286
DRINKING GLASS
Timo Tapani Sarpaneva, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Iittala, Finland
Filed Aug. 26, 1974, Ser. No. 500,659
Claims priority, application Finland Feb. 25, 1974
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—11

240,287
DRINKING GLASS
Timo Tapani Sarpaneva, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Iittala, Finland
Filed Aug. 26, 1974, Ser. No. 500,660
Claims priority, application Finland Feb. 25, 1974
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—11

240,288
ROLLING PIN CUTTER
Jeffrey D. Wright, 1706 Gold SE., Albuquerque, N. Mex. 87106
Filed Sept. 13, 1974, Ser. No. 505,751
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43

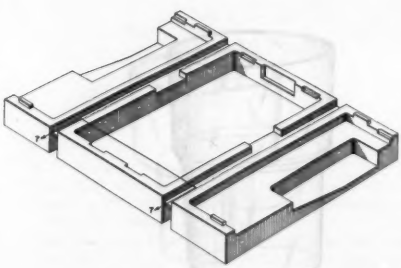


240,289
CONTAINER LID LIFTING TOOL
Warren Skinner, 1045 Clarendon 39, Sheridan, Wyo. 82801
Filed Jan. 20, 1975, Ser. No. 542,223
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—40

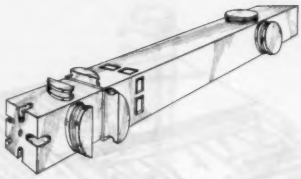
240,290
DOOR PROP FOR PREVENTING OPENING OF THE DOOR
James W. Nash, 1310 S. Catalina, Redondo Beach, Calif. 90277
Filed Sept. 30, 1974, Ser. No. 510,597
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—203

240,291
BOTTLE
Albert Eric Victor Page, St. Albans, England, assignor to Schenley Industries Inc.
Filed July 3, 1974, Ser. No. 485,553
Claims priority, application Great Britain Feb. 26, 1974
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—47

240,292
CONTAINER FOR A PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
John A. Beaumont, Walpole, Mass., assignor to Polaroid Corporation
Continuation-in-part of design application Ser. No. 268,153, June 30, 1972. This application Feb. 28, 1974, Ser. No. 446,589
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—232

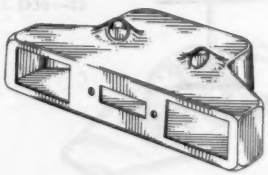


240,293
O-RING MEASURING GAUGE
James S. Bogart, Farmington Hills, Mich., and John M. Wilcox, Columbia, S.C., assignors to Federal-Mogul Corporation, Southfield, Mich.
Filed Oct. 29, 1974, Ser. No. 518,611
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

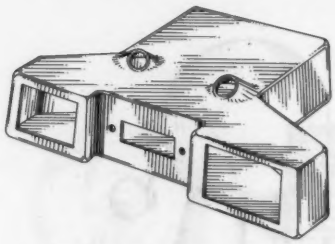


240,294
LIFT TRUCK BODY
Donald J. De Priester and Darrell C. Fuller, Niles, Mich., assignors to Clark Equipment Company
Filed Nov. 27, 1974, Ser. No. 527,787
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—61

240,295
ACCESSORY CONSOLE FOR MOTORCYCLES
Tommy W. Dixson, 1509 W. Willetta, Phoenix, Ariz. 85007
Filed Feb. 24, 1975, Ser. No. 552,301
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

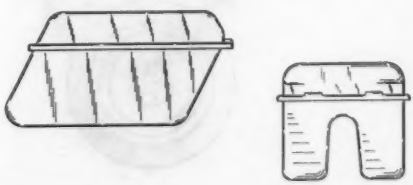


240,296
ACCESSORY CONSOLE FOR MOTORCYCLES
Tommy W. Dixson, 1509 W. Willetta, Phoenix, Ariz. 85007
Filed Feb. 21, 1975, Ser. No. 551,536
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

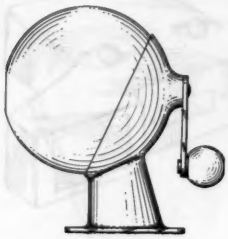


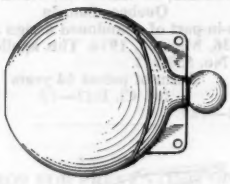
240,297
NESTABLE STROLLER
Antoine Trubiano, 36 Marien St., Montreal East 550, Quebec, Canada
Continuation-in-part of abandoned design application Ser. No. 452,936, Mar. 20, 1974. This application Mar. 13, 1975, Ser. No. 557,912
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

240,298
BICYCLE SADDLE BAG
Melbert A. Kline, 1157 Silverdale, Wichita, Kans. 67218
Filed Oct. 16, 1974, Ser. No. 515,240
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



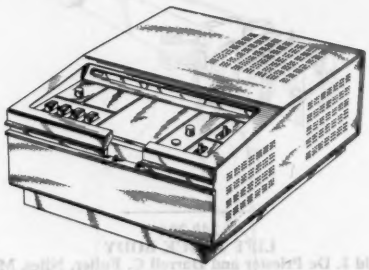
240,299
PENCIL SHARPENER
Wayne C. Hoffman, Chalybes Road, Roxbury, Conn. 06783
Filed Feb. 6, 1975, Ser. No. 547,755
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—74





240,300
WATER FILTER OR SIMILAR ARTICLE
Charles Gelman and Attila Vadnay, Ann Arbor, Mich., assignors to Gelman Instrument Company
Filed June 27, 1975, Ser. No. 590,904
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

240,301
MAGNETIC VIDEO REPRODUCER
Takao Takanashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 20, 1975, Ser. No. 542,418
Claims priority, application Japan July 22, 1974
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B



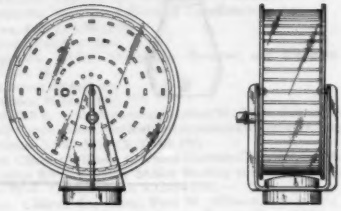
240,302
POLE TELEPHONE
Douglas P. Montague, Chicago, and Howard J. Morrison, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Sept. 30, 1975, Ser. No. 618,071
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

240,303
LIGHTER
Guy Neyret, Francheville, Rhone, France, assignor to Etablissements Genoud & Cie, Venissieux, Rhone, France
Filed Aug. 30, 1974, Ser. No. 502,229
Claims priority, application France Mar. 13, 1974
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

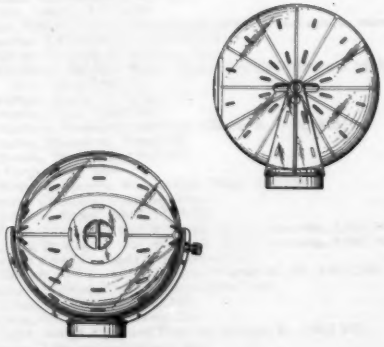
240,304
LIGHTER
Guy Neyret, Francheville, Rhone, France, assignor to Etablissements Genoud & Cie, Venissieux, Rhone, France
Filed Aug. 30, 1974, Ser. No. 502,230
Claims priority, application France Mar. 13, 1974
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

240,305
COMBINED AQUARIUM AERATOR AND ORNAMENT HOLDER
Bernard Suchowski, Marlboro, David D. Lovitz, Short Hills, and Claud W. Kissin, Fort Lee, N.J., assignors to The Hartz Mountain Corporation, Harrison, N.J.
Filed Jan. 30, 1975, Ser. No. 545,627
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—12

240,306
ROTARY PLAY EXERCISER FOR A PET ANIMAL
Bernard Suchowski, Marlboro, David D. Lovitz, Short Hills, and Claud W. Kissin, Fort Lee, N.J., assignors to The Hartz Mountain Corporation, Harrison, N.J.
Filed Jan. 30, 1975, Ser. No. 545,367
Term of patent 14 years
Int. Cl. D30—*07*
U.S. Cl. D30—42



240,307
ROTARY PLAY EXERCISER FOR DOMESTIC ANIMALS
Bernard Suchowski, Marlboro, David D. Lovitz, Short Hills, and Claud W. Kissin, Fort Lee, N.J., assignors to The Hartz Mountain Corporation, Harrison, N.J.
Filed Jan. 30, 1975, Ser. No. 545,629
Term of patent 14 years
Int. Cl. D30—*07*
U.S. Cl. D30—42



240,308
TOY DOG FIGURE
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Feb. 10, 1975, Ser. No. 548,631
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

240,309
TOY PIG FIGURE
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Feb. 10, 1975, Ser. No. 548,643
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JUNE, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
Dooley, James P.; and Dake, Roger O., 3,962,770.

A. C. Hamilton & Co.: *See—*
Latter, Geoffrey, 3,963,401.

A. E. Staley Manufacturing Company: *See—*
Bulich, Anthony A., 3,963,575.

A. H. Robins Company, Incorporated: *See—*
Cale, Albert Duncan, Jr.; and Leonard, Charles Arthur, 3,963,745.

A. O. Smith Harvestore Products, Inc.: *See—*
Olson, George E., 3,962,925.

A/S Atlas: *See—*
Bressendorff, Leon Leopold Breslau, 3,962,887.

AB Bofors: *See—*
Gatenbeck, Sten Vilhelm; and Hedman, Per Olof, 3,963,572.
Skagerlund, Lars-Erik; and Stalfors, Rolf Lennart, 3,962,972.

AB Volvo: *See—*
Lineberg, Birger David, 3,963,535.

AB Wicanders Korkfabriker: *See—*
Harding, Sune, 3,963,140.

Abbott Laboratories: *See—*
Chu, Daniel Tim-Wo; and Garmaise, David Lyon, 3,963,774.
Martin, Jerry Roy; Tadanier, John Soloman; and Goldstein, Alma Whitman, 3,963,696.

Abel, Irving R., to Honeywell Inc. Wide field reflective optical apparatus. 3,963,328, Cl. 350-294.000.

Abolins, Andrew, to Strick Corporation. Hinge butt and mounting assembly. 3,962,749, Cl. 16-135.000.

Abrahams, Robert A. Alcohol soluble hydrophilic polymer via aqueous polymerization. 3,963,685, Cl. 526-230.000.

Accumulatorenfabrik Sonnenschein GmbH: *See—*
Jache, Otto, 3,963,521.

ACF Industries, Incorporated: *See—*
Kalert, Ralph E.; and Smith, Robert J., 3,963,670.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See—*
Glaesener, Ernest, 3,963,218.

Acres, Gary James Keith; and Cooper, Barry John, to Johnson Matthey & Co., Limited. Catalysis. 3,963,827, Cl. 423-239.000.

Adachi, Yasaburo; and Tsuru, Hiroaki, to Hochiki Corporation. Ionization smoke detector co-used to issue fire alarm and detect ambient atmosphere. 3,964,036, Cl. 340-237.00S.

Adamian, Michael R. Automatic headlight control circuit. 3,963,940, Cl. 307-10.0LS.

Advanced Instrument Development, Inc.: *See—*
Fiocca, Louis L.; Schmutzer, Joel J.; and Klusendorf, John I., 3,963,930.

Aeroceanics Fishways Corporation: *See—*
Phillips, Adrian, 3,962,876.

AGA Aktiebolag: *See—*
Wiklund, Klas Rudolf, 3,963,356.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Durand-Vienne, Robert Rene, 3,963,907.
Kleitz, Michel; Fabry, Pierre; and Fouletier, Jacques, 3,963,597.
Teichner, Stanislas; and Gardes, Gerard, 3,963,646.

Agency of Industrial Science & Technology: *See—*
Tanie, Kazuo, 3,963,866.

AGFA-Gevaert, A.G.: *See—*
Hujer, Friedrich; Weinert, Volker; and Fengler, Harald, 3,963,344.
Wagner, Karl, 3,964,074.

AGFA-GEVAERT N.V.: *See—*
Florens, Raymond Leopold, 3,963,494.
Vanassche, Willy Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 3,963,493.

Agui, Hideo: *See—*
Nakagome, Takenari; Agui, Hideo; Mitani, Toru; and Nakashita, Mitsuo, 3,963,736.

Aho, Yrjo, to Exel Oy. Snow disk for a ski staff. 3,963,254, Cl. 280-11.37Z.

Aiken, Howard H. Successive approximation analog to digital converter. 3,964,061, Cl. 340-347.0AD.

Air Products and Chemicals, Inc.: *See—*
Kohnen, Keith, 3,963,381.

Airco, Inc.: *See—*
Muska, Allen V., 3,962,881.

Aitken, Walter Brent; Bussian, Ronald Wayne; Menson, Robert Carroll; and Narayanswamy, Venkatachalam, to Du Pont de Nemours, E. I., and Company. Stabilization of phosphoenol pyruvate carboxylase. 3,963,578, Cl. 195-63.000.

Akademiet for De Tekniske Videnskaber, svejsecentralen: *See—*
Lund, Svend Aage, 3,962,909.

Akita, Toshikazu: *See—*
Yonezawa, Masatomo; Ohno, Tomeji; Iwase, Keizo; Takada, Toshio; Kiyama, Masao; and Akita, Toshikazu, 3,963,630.

Aktiebolaget Electrolux: *See—*
Hammar, John Rune, 3,962,886.

Aktiebolaget Leo: *See—*
Hogberg, Knut Bertil; Fex, Hans Jacob; Konyves, Imre; and Stamvik, Anders Robert, 3,963,707.

Aktiebolaget Ljungmans Verkstader: *See—*
Esbjornsson, Stig Uno Ingvar, 3,963,146.

Aktiebolaget Platmanufaktur: *See—*
Jensen, Claes-Goran; and Hansson, Lars Olof, 3,963,918.

Aktiebolaget Svenska Flaktfabriken: *See—*
Holmberg, Roy; and Strindehag, Ove, 3,963,810.

Aktiebolaget Tudor: *See—*
Eckerbom, Gunnar; and Nilsson, Ove, 3,963,517.

Aktieselskabet Nordiske Kabel-OG Traadfabriker: *See—*
Lunn, Borge, 3,963,526.

Akutagawa, Susumu: *See—*
Nagakura, Akira; Akutagawa, Susumu; and Kurihara, Haruki, 3,963,782.

Akzona Incorporated: *See—*
Heyboer, Nico, 3,963,775.

Albright, Bill E.; and Meginniss, Stephen M., III, to American Hospital Supply Corporation. Method and apparatus for determining coagulation times. 3,963,349, Cl. 73-64.100.

Albright, Charles William, to Union Carbide Corporation. Method and apparatus for conveying and/or heating coal particles in a dense phase flow. 3,963,415, Cl. 432-14.000.

Aldridge, Clifton, Jr.; Jones, Paul W.; Gibson, Sandra F.; Vannest, Richard D.; Holen, James T.; Keyser, George F.; and Meyer, Michael C., to McDonnell Douglas Corporation. Process and apparatus for analyzing specimens for the presence of microorganisms therein. 3,963,355, Cl. 356-201.000.

Alexander, Ernest John, to Sterling Drug Inc. 2-(Piperazinoethyl)-6,7-dihydroindol)[1,7-an][1]benzazepine. 3,963,721, Cl. 260-268.0PC.

Alexeff, Alexander V., to Alexeff-Snyder Enterprises, Inc. Method of making a fabric splice. 3,962,762, Cl. 28-72.00R.

Alexeff-Snyder Enterprises, Inc.: *See—*
Alexeff, Alexander V., 3,962,762.

Alfa Romeo S.p.A.: *See—*
Garcea, Giampaolo, 3,963,808.

Alford, Allen John: *See—*
Brady, Philip James; and Alford, Allen John, 3,962,953.

Alger, Terry W.; Schlitt, Leland G.; and Bradley, Laird P., to United States of America, Energy Research and Development Administration. Slit injection device. 3,963,994, Cl. 331-94.5PE.

Alien, Imant Karlovich; Nikonenko, Anatoly Vasilievich; Popov, Jury Olegovich; Yanson, Boris Albertovich; and Khesin, Arkady Yakovlevich. Apparatus for discriminating a peak level of a video signal. 3,963,991, Cl. 328-150.000.

Alleman, Raymond Arthur: *See—*
Stewart, John Franklin; Alleman, Raymond Arthur; and Weingarten, Morris Robert, 3,962,764.

Allen, Burl A. Safety apparatus for a cable feed system. 3,962,943, Cl. 83-370.000.

Alley, Raymond L.; and Ordorica, Miguel A., to American Warming and Ventilating Inc. Condition controlling air flow damper. 3,963,070, Cl. 165-98.000.

Allmanna Ingenjorsbyran AB: *See—*
Vor, Zdenek, 3,963,620.

Altman, Gerald. Low profile episcopic projector and opaque materials therefor. 3,963,338, Cl. 353-120.000.

Aluminum Company of America: *See—*
Anderson, William Albert; McKee, Arvil Burke; and McBride, John Knox, 3,963,143.
Ballain, Marlyn D., 3,963,817.
Brasko, Peter, 3,963,594.
Hawkins, Ronald G.; and Russ, Charles R., 3,963,855.
Kelsey, Ronald A., 3,962,976.
Kondis, Thomas J., 3,963,482.

Alza Corporation: *See—*
Whitaker, Gordon W.; and Gad, Yigal, 3,963,025.

American Cyanamid Company: *See—*
Behrens, Rudolf Adolf, 3,963,797.
Cross, Barrington; and Walworth, Bryant Leonidas, 3,963,741.
Cross, Barrington; and Walworth, Bryant Leonidas, 3,963,742.

American Hospital Supply Corporation: *See—*
Albright, Bill E.; and Meginniss, Stephen M., III, 3,963,349.

American Machine Products Corporation: *See—*
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American Optical Corporation: *See—*
Segre, Joseph Pipo; and Truscott, Norman R., 3,963,347.

American Telecommunications: *See—*
Tucker, Council A., 3,963,318.

American Warming and Ventilating Inc.: *See—*
Alley, Raymond L.; and Ordorica, Miguel A., 3,963,070.

Ametek, Inc.: *See—*
Daubman, Edward A.; and Sherlock, John W., 3,963,175.

Amey, David Anthony: *See—*
Gittos, Maurice Ward; and Amey, David Anthony, 3,963,729.

AMP Incorporated: *See—*
Anderson, Leslie Alan; Cea, Carmen Achille; and Gentry, John Maury, 3,962,901.
Askman, Jan Philip; and Wolverton, George Warren, 3,963,295.
Glover, Douglas Wade; and Gardner, Mervin Amos, 3,963,296.
Hays, Kenneth Scott, 3,963,303.
Patton, George Allen; and Tucci, John James, 3,963,300.
Reynolds, Charles Edward; and Weidler, Charles Harry, 3,963,857.
Schumacher, William Ludlow; and Volinskie, Robert, 3,963,319.
Williams, Benjamin Charles, 3,963,316.

Anchor Hocking Corporation: *See—*
Hart, Alexander W., 3,963,142.

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Protective screw cap for the writing point of a tube writing pen. 3,963,359, Cl. 401-258.000.

Anderson, D. Richard; Courtney, Robert L.; and Harrah, Larry A., to United States of America, Energy Research and Development Administration. Low temperature, low pressure hydrogen gettering. 3,963,826, Cl. 423-248.000.

Anderson, Edwin A.; and Webb, Derrel D. Double acting mechanical jar. 3,963,081, Cl. 175-304.000.

Anderson, Glenn W.: *See—*
Hutchison, Stanley O.; Anderson, Glenn W.; and Newby, Gordon L., 3,963,654.

Anderson, Harld Elden: *See—*
Kruckenberg, Perry Lester; Anderson, Harld Elden; and Carlson, Ray Lavette, 3,963,001.

Anderson, Leslie Alan; Cea, Carmen Achille; and Gentry, John Maury, to AMP Incorporated. Electrical connector tap assembly apparatus. 3,962,901, Cl. 72-410.000.

Anderson, Matthew E.; and Redmond, Stephen L., to United States of America, Navy. Pressure-armed ordnance fuze. 3,962,974, Cl. 102-81.000.

Anderson, Roger G., to Raymond Lee Organization, Inc., The. Safety ski lock. 3,962,893, Cl. 70-19.000.

Anderson, William Albert; McKee, Arvil Burke; and McBride, John Knox, to Aluminum Company of America. Container including an aluminum panel having a portion removable by tearing. 3,963,143, Cl. 220-64.000.

Anderson, William G. System and hot cabinet server. 3,962,962, Cl. 99-474.000.

Andrasi, Ferenc: *See—*
Farkas, Lajos; Kasztreiner, Endre; Andrasi, Ferenc; Borsi, Jozsef; Elekes, Istvan; and Polgari, Istvan, 3,963,735.

Andrews, John Marshall, Jr.; Ryder, Robert Morgan; and Sze, Simon Min, to Bell Telephone Laboratories, Incorporated. Schottky barrier diode contacts. 3,964,084, Cl. 357-15.000.

Anglian Water Authority: *See—*
Smith, Fred, 3,963,640.

Annunziata, Eugene Joseph; and Christensen, Neal Taylor, to International Business Machines Corporation. Hierarchy response priority adjustment mechanism. 3,964,054, Cl. 340-172.500.

Ansari, Hifzur Rahman: *See—*
Jones, Barry Nicholas; Ansari, Hifzur Rahman; Jaggers, Brian George; and Janes, John Francis, 3,963,648.

Anschel, Morris; and Shear, Stephen Anthony, to International Business Machines Corporation. Catalytic surface preparation for electroless plating. 3,963,841, Cl. 427-304.000.

Antonaccio, Joseph C., to Wheelock Signals, Inc. Fire-alarm audible signaling system permitting selective communications and signaling. 3,964,047, Cl. 340-310.00R.

Anvar, Agence Nationale de Valorisation de la Recherche: *See—*
Fauchez, Jean-Jacques, 3,964,023.

Aoki, Akihiro: *See—*
Ozawa, Shuji; Aoki, Akihiro; and Fujie, Hiroshi, 3,963,664.

Aoki Construction Company Limited: *See—*
Ono, Hiromu, 3,962,983.

Aoki, Katashi, to Nissei Plastics Industrial Co., Ltd. Injection blow molding apparatus for hollow article having openings at both ends. 3,963,398, Cl. 425-242.00B.

Aoyagi, Takaaki: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takamatsu, Akira; and Inui, Taiji, 3,963,579.

Aqua-Chem, Inc.: *See—*
Rehm, Gustav A., 3,962,999.
Rulseh, Roy M., 3,963,182.

Aquilina, Robert R.; Masson, Robert A.; and Jerez, Norbert A., to Etat Francais, represented by Delegation Ministerielle pour l'Armement. Apparatus for measuring variations in floatability of a float due to variations in pressure. 3,962,902, Cl. 73-37.000.

Arai, Hiroshi; and Shibatani, Juichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Test system for skid control apparatus. 3,964,017, Cl. 340-52.00C.

Aramaki, Kuninori; Kawaguchi, Yasuharu; and Kawakami, Hiroshi, to Bridgestone Tire Company Limited. Oil fence having a limited flexibility. 3,962,875, Cl. 61-1.00F.

Archifar Industrie Chimiche del Trentino S.p.A.: *See—*
Marsili, Leonardo; and Pasqualucci, Carmine, 3,963,705.

Arimoto, Masahiro: *See—*
Ueno, Katsujiro; Sato, Makoto; Arimoto, Masahiro; Kojima, Hiroshi; Yamasaki, Terukiyo; and Sakurai, Takeo, 3,963,727.

Arisaka, Masayuki, to Fuji Photo Film Co., Ltd. Auto-process film unit with removable folded sheet between negative and positive elements. 3,963,496, Cl. 96-76.00C.

Armco Steel Corporation: *See—*
Elias, James A., deceased; Newby, John R.; and Pierson, Marvin B., 3,963,531.

Armstrong, Ralph L. J.; and Stockton, Jeffrey M. Gang-type price marker. 3,962,971, Cl. 101-42.000.

Arnold, Bruce K., to International Telephone and Telegraph Corporation. Fiber optic connector with protective cable sleeves. 3,963,323, Cl. 350-96.00C.

Arnstein, Bennett R. Kite with a diverging wing struts with a center strut and a crossing-strut secured to both diverging struts and the center strut. 3,963,200, Cl. 244-153.00R.

Arthur, Jett C., Jr.; Mod, Robert R.; and Harris, James A., to United States of America, Agriculture. Ultraviolet-initiated preparation of N,N-dibutyl-9(10)-dibutylphosphonooctadecanamide. 3,963,570, Cl. 204-158.00R.

Aryamane, Avinash P.: *See—*
Williamson, Harold L.; and Aryamane, Avinash P., 3,962,782.

Asahi, Akira: *See—*
Ishi, Toshiharu; Asahi, Akira; Fujita, Hiroaki; Sato, Takeshi; and Urabe, Nobusuke, 3,963,773.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kurei, Hiroshi; and Haraguchi, Keisuke, 3,964,078.
Mita, Kunio, 3,964,082.
Takahashi, Yasuo, 3,963,325.

Ashland Oil, Inc.: *See—*
Culbertson, Billy M., 3,963,703.

Askman, Jan Philip; and Wolverton, George Warren, to AMP Incorporated. Heat-shrinkable molded high voltage connector. 3,963,295, Cl. 339-60.00R.

Asplund, Erkki Kalevi: *See—*
Rautia, Veli Matti; and Asplund, Erkki Kalevi, 3,963,116.

Aspro-Nicholas Limited: *See—*
Gittos, Maurice Ward; and Amey, David Anthony, 3,963,729.

Associated Engineering Limited: *See—*
Noddings, John; and Hunt, Norman, 3,963,091.

Atkins, Thomas M., to Kelsey-Hayes Company. Skid control system embodying fail safe bypass. 3,963,276, Cl. 303-21.0AF.

Atlas Pacific Engineering Company: *See—*
Ellis, Robert G., 3,962,963.

Ato Chimie: *See—*
Peyrouset, Andre; and Prechner, Roland, 3,962,907.

Atomic Energy of Canada Limited: *See—*
Ormrod, John H., 3,963,934.

Atwood, John G.; and Heinz, Peter H., to Perkin-Elmer Corporation, The. Method and apparatus for computation in a kinetic analyzer. 3,963,909, Cl. 235-151.350.

Aufdermarsh, Carl Albert, Jr., to Du Pont de Nemours, E. I., and Company. Finely divided blocked isocyanates prepared in the presence of surfactants. 3,963,710, Cl. 260-247.20A.

Authement, Elmo C.; Varvaro, Gasper G.; Stupka, Frank S.; Waguespack, Obierge J.; Tabor, Sidney J.; and Guell, Mario R. Air and fuel charge forming device. 3,963,013, Cl. 123-133.000.

Automated Building Components, Inc.: *See—*
Jureit, John Calvin; and Robey, Gerald E., 3,963,452.

Automated Construction Industries, Inc.: *See—*
Bourdo, John Lorin, 3,963,395.

Automobiles Peugeot: *See—*
Rivere, Jean-Pierre, 3,963,987.

Auxer, Bennie C.: *See—*
Brumberger, Neil A.; Auxer, Bennie C.; and Rush, Donald L., 3,963,201.

Avar, Lajos; and Hofer, Kurt, to Sandoz Ltd. 1,3-Dihydrocarbylpyrazole compounds as stabilizers for organic materials. 3,963,737, Cl. 260-299.000.

Avco Corporation: *See—*
Balje, Otto E., 3,963,369.

Aymard, Rene: *See—*
Voituriez, Henry; and Aymard, Rene, 3,963,128.

AZO-Maschinenfabrik Adolf Zimmermann: *See—*
Zimmermann, Adolf; Lesk, Adolf; Jordan, Walter; and Baumann, Rudi, 3,963,608.

B.W.B. Controls, Inc.: *See—*
Theriot, Gerald F.; and Hoofnagle, Frank M., 3,963,050.

Babb, Edward, to International Computers Limited. Information retrieval systems. 3,964,029, Cl. 340-172.500.

Babb Engineering Company Limited: *See—*
Brady, Philip James; and Alford, Allen John, 3,962,953.

Babcock & Wilcox Limited: *See—*
Muir, William McClements, 3,963,618.

Babenko, Julia Semenovna: *See—*
Shinkarenko, Ljubov Nikolaevna; Babenko, Julia Semenovna; and Grigoriev, Evgeny Fedorovich, 3,963,577.

Babor, Rud J. Columns for platforms, piers, causeways and the like, and method of erecting same. 3,962,880, Cl. 61-53.740.

Bachelard, Roland, to Produits Chimiques Ugine Kuhlmann. Process for extracting chromium from chromium ores. 3,963,824, Cl. 423-61.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Fischer, Adolf, 3,963,477.

Baer, Donald R.; Cairncross, Allan; and Smith, Michael, to Du Pont de Nemours, E. I., and Company. Substituted pyrazines. 3,963,715, Cl. 260-250.0BN.

Baggott, George T., to Crescent Metal Products, Inc. Rack for storing trays or the like. 3,963,125, Cl. 211-126.000.

Bailey, Denis M., to Sterling Drug Inc. Herbicidal pyrrole-2-carboxamides. 3,963,480, Cl. 71-95.000.

Bailey, Denis M., to Sterling Drug Inc. 4,5 Dihalopyrrol 2-yl di and tri halomethyl ketones. 3,963,746, Cl. 260-326.50J.

Bailey, George W.: *See—*
Donovan, Robert W.; Kolster, Harvey L.; Broeker, Herbert H.; and Bailey, George W., 3,963,913.

Bainard, Dean R., to Garlock Inc. Unitized dual lip seal. 3,963,248, Cl. 277-92.000.

Baker Oil Tools, Inc.: *See—*
Winslow, Larry K., 3,963,076.

Baker, Weldon S. Hydraulic valve lifter or adjuster. 3,953,007, Cl. 123-90.160.

Baldwin, John J.: *See—*
Novello, Frederick C.; and Baldwin, John J., 3,963,731.

Balje, Otto E., to Avco Corporation. Diffuser including movable vanes. 3,963,369, Cl. 415-148.000.

Ballain, Marlyn D., to Aluminum Company of America. System for rehydration of curing of shaped activated green ceramic structures. 3,963,817, Cl. 264-56.000.

Balodis, Miroslaw: *See—*
Flagg, Delbert; and Balodis, Miroslaw, 3,964,062.

Bancroft, Barrie, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the. Respirators. 3,963,021, Cl. 128-145.00R.

Banez, Armin V. Method of sterilizing a fiberoptic proctoscope. 3,963,438, Cl. 21-58.000.

Banker, Oscar H. Automatic light switch and battery disconnect. 3,963,941, Cl. 307-10.0BP.

Banks, Paul J., to Monarch Marking Systems, Inc. Web of record assemblies. 3,963,124, Cl. 206-527.000.

Bardos, Andrew M., to Harris Corporation. Optical system for storing information. 3,964,032, Cl. 340-173.0LM.

Barefoot, Carlton K., to Tred-X Corporation. Endless tread mold apparatus. 3,963,393, Cl. 425-20.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Schippers, Heinz, 3,962,829.

Barwin Pty. Limited: *See—*
Hutton, Albert John; Hutton, Allen William; and Dellit, Richard John, 3,962,935.

BASF Aktiengesellschaft: *See—*
Fischer, Adolf, deceased, 3,963,474.
Fischer, Adolf, deceased, 3,963,475.
Fischer, Adolf, deceased, 3,963,476.
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Schefczik, Ernst; and Grychtol, Klaus, 3,963,747.
Wurmb, Rolf; Schmidt, Franz; and Petersen, Harro, 3,963,668.
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Basilone, Anthony J.: *See—*
Sivertz, Christian; and Basilone, Anthony J., 3,963,842.

Bastenhof, Dirk, to Societe d'Etudes de Machines Thermiques. Erosion-preventing device for a lift-and-force pump. 3,963,384, Cl. 417-499.000.

Baudet, Jacques; Salmon, Michel; and Sausse, Andre, to Rhone-Poulenc S.A. Fluid treatment apparatus. 3,963,622, Cl. 210-321.00R.

Bauer, Fritz: *See—*
Stadelmann, Ludwig; and Bauer, Fritz, 3,963,101.

Bauer, Jakob; and Winkler, Albert, to Varta Batterie Aktiengesellschaft. Primary cell corrosion inhibitor. 3,963,520, Cl. 136-107.000.

Baumann, Bernard: *See—*
Cospen, Jean; and Baumann, Bernard, 3,963,814.

Baumann, Rudi: *See—*
Zimmermann, Adolf; Leak, Adolf; Jordan, Walter; and Baumann, Rudi, 3,963,608.

Bausch & Lomb Incorporated: *See—*
Martin, Guy E., 3,963,306.

Baxter, George, to Moore Business Forms, Inc. Clay-coated record material of improved image durability. 3,963,852, Cl. 428-325.000.

Baxter Laboratories, Inc.: *See—*
Newman, Ferris E., 3,963,621.

Bayer Aktiengesellschaft: *See—*
Gipp, Roland; Muller, Erwin; and Oberkirch, Wolfgang, 3,963,800.
Hederich, Volker; Kroeck, Friedrich Wilhelm; Gehrke, Guenter; and Neeff, Rutger, 3,963,763.
Hohmann, Walter, 3,963,762.
Meisert, Ernst; and Goyert, Wilhelm, 3,963,656.
Naumann, Klaus; Lurssen, Klaus; and Sasse, Klaus, 3,963,749.
Nonn, Konrad; and Wagner, Kuno, 3,963,430.
Schutz, Siegimund; Behner, Otto; and Hoffmeister, Friedrich, 3,963,778.
Ullrich, Martin; Meisert, Ernst; and Eitel, Alfred, 3,963,679.
Vogel, Axel, 3,963,761.
Winter, Gerhard; Deissmann, Walter; Gutsche, Walter; and Woditsch, Peter, 3,963,585.

Baysinger, Robert L., to Emerson Electric Co. Control system for domestic gas oven burners. 3,963,410, Cl. 431-46.000.

BBC Brown Boveri & Company Limited: *See—*
Berndes, Gunter; and Krassin, Horst, 3,964,091.
Wild, Peter, 3,963,312.

Beal, Glenn I., to R. M. Smith, Inc. Carded hardware article package. 3,963,123, Cl. 206-495.000.

Beaudoin, Guy; and Vincent, Marcel. Variable diameter pulley with improved pusher ring. 3,962,927, Cl. 74-230.17E.

Beaudoin, Guy; and Vincent, Marcel. Variable diameter pulley with shim means compensating for belt wear. 3,962,928, Cl. 74-230.17B.

Beauregard, William W., to Springfield Wire, Inc. Dual sealing solenoid valve. 3,963,049, Cl. 137-614.180.

Beck, Henry T.; and Koehler, Rudolph, to Noma Lites Canada Limited. Method of molding electrical lamp sockets. 3,963,822, Cl. 264-251.000.

Becker, Manfred, to Siemens Aktiengesellschaft. Manufacture of uranium dioxide powder. 3,963,828, Cl. 423-261.000.

Becton, Dickinson and Company: *See—*
North, Howard Lincoln, Jr., 3,963,151.

Bedwell, Thomas A.; and Zollinger, Doyle D., to Hesston Corporation. Loading and cleaning elevator for harvesters. 3,963,607, Cl. 209-73.000.

Beecham Group Limited: *See—*
Crisp, David John, 3,963,357.
Ferres, Harry; and Clayton, John Peter, 3,963,702.
Ferres, Harry, 3,963,704.
Goudie, Alexander Crossan, 3,963,750.

Beghin, Michel Charles Marie, to Societe Nouvelle B.I.P.T. (Bureau International de Prestations Techniques). Method of combined navigation of a barge or a lighter on sea and inland waters and apparatus for carrying out the said method. 3,962,984, Cl. 115-17.000.

Behl, Ravi, to Vapor Corporation. Circuit for detecting burned-out lamp for a buoy lamp changer. 3,964,040, Cl. 340-251.000.

Behn, Charles W.: *See—*
Wethe, David A.; Behn, Charles W.; and Willetts, Richard B., 3,964,019.

Behner, Otto: *See—*
Schutz, Siegimund; Behner, Otto; and Hoffmeister, Friedrich, 3,963,778.

Behrens, Rudolf Adolf, to American Cyanamid Company. Acrylic elastomer compositions with improved aging properties. 3,963,797, Cl. 260-837.00R.

Beine, Burkhard; and Schilling, Franz, to Siempelkamp Giesserei KG. Burst shield for a pressurized nuclear-reactor core and method of operating same. 3,963,563, Cl. 176-19.00R.

Beine, Burkhard, to Siempelkamp Giesserei KG. Holddown arrangement for removable cover of a pressurized nuclear-reactor core and method of using same. 3,963,565, Cl. 176-38.000.

Beining, August H. Article for increasing the life expectancy of filament light bulbs. 3,963,956, Cl. 315-71.000.

Bejtlich, Leonard M. Ski clamping apparatus. 3,963,234, Cl. 269-296.000.

Bel Fuse Inc.: *See—*
Bernstein, Elliot; and Rosenberg, Richard, 3,964,009.

Belady, Laszlo A.; and Palermo, Frank P., to International Business Machines Corporation. System and method for evaluating paging behavior. 3,964,028, Cl. 340-172.500.

Bell Telephone Laboratories, Incorporated: *See—*
Andrews, John Marshall, Jr.; Ryder, Robert Morgan; and Sze, Simon Min, 3,964,084.
Blank, Stuart Lawrence; and Le Craw, Roy Conway, 3,964,035.
Caldwell, James Lewis, 3,963,869.
Edwards, Roger; Evans, William Joshua; Grant, Wesley Norman; and Murphy, Bernard Thomas, 3,962,779.
Feldman, Martin; and White, Donald Lawrence, 3,963,354.
Gopinath, Bhaskarpillai; and Kurshan, Robert Paul, 3,963,905.
Hess, William Emil, Jr., 3,963,974.
Holtz, Roger Edward; and Radosevich, Roger Allen, 3,963,876.
Jaeger, Raymond Edward; MacChesney, John Burnette; Pinnow, Douglas Arthur; and Van Uitert, LeGrand Gerard, 3,963,468.
Kahng, Dawon; La Bate, Ernest Edward; Lepselter, Martin Paul; and Ligenza, Joseph Raymond, 3,964,085.
Knollman, Dieter John Henry, 3,963,957.
Koo, James Teh-Zen, 3,964,030.
Morris, Robert, 3,964,059.
Poon, Hin-Chiu; and Scharfetter, Donald Lee, 3,964,089.
Sequin, Carlo Heinrich; and Wilde, Peter Van Dyke, 3,963,942.

Bella, Frank, Jr., to Whiting Corporation. Cooling aqueous alkali metal hydroxide liquors by vacuum evaporation with subsequent solids precipitate removal. 3,963,424, Cl. 23-296.000.

Beloit Corporation: *See—*
Grenlund, Wesley E., 3,962,911.

Bendix Corporation, The: *See—*
Brandao, Ruy L.; Taylor, Robert A., Jr.; and Bendix Corporation, The, 3,964,064.
Hoffman, Gary R.; and Rinkers, William P., 3,963,993.
Remus, Casimer Frank, 3,964,049.

Benerito, Ruth R.: *See—*
Ward, Truman L.; and Benerito, Ruth R., 3,963,433.
Ward, Truman L.; Benerito, Ruth R.; and Perrier, Dorothy M., 3,963,434.
Ward, Truman L.; and Benerito, Ruth R., 3,963,435.

Bennes Marrel: *See—*
Corompt, Antoine, 3,962,965.

Bennett, Gregory B., to Sandoz, Inc. Furo(3,4-e)-as-triazines and corresponding 4-oxides. 3,963,713, Cl. 260-248.0AS.

Bennett, William P.; and Haller, Jacob, to Programming Technologies, Inc. Automatic tape loading apparatus for cassettes and the like. 3,964,100, Cl. 360-95.000.

Bentley, John; Letchford, Brian Robert; and Stafford, Thomas Whitehead, to Imperial Chemical Industries Limited. Flexible coated sheet material. 3,963,848, Cl. 428-172.000.

Bereman, Jon A.: *See*—
Borbely, Alexander S.; and Bereman, Jon A., 3,963,502.
Beres, Steven W.: *See*—
Steiman, Wolf; and Beres, Steven W., 3,963,150.
Bergeson, Richard P., to Maytag Company, The. Dishwasher. 3,963,046, Cl. 137-565.000.
Bergwerksverband GmbH: *See*—
Stumpf, Willy; Queiser, Horst; Juntgen, Harald; Schroter, Hans-Jurgen; and Knoblauch, Karl, 3,963,460.
Berkenhoff & Drebes Gesellschaft mit beschrankter Haftung: *See*—
Tillmann, Klaus Erich, 3,962,898.
Bernardi, Luigi; and Patelli, Bianca, to Societa' Farmaceutici Italia S.p.A. Selective demethylation of anthracycline derivatives. 3,963,760, Cl. 260-365.000.
Berndes, Gunter; and Krassin, Horst, to BBC Brown Boveri & Company Limited. Two-way semiconductor switch. 3,964,091, Cl. 357-39.000.
Bernstein, Elliot; and Rosenberg, Richard, to Bel Fuse Inc. AC radiation choke insulator. 3,964,009, Cl. 336-90.000.
Berta, Peter, to Fairmont Foods Company. Method and apparatus for making shaped shells for hors d'oeuvres, snacks and the like, and food articles prepared thereby. 3,963,402, Cl. 425-299.000.
Berwald, Ernst, to Schering Aktiengesellschat. Transport container for dangerous liquids. 3,963,144, Cl. 220-85.00P.
Besser Company: *See*—
Cruzen, Harry F.; and Gresham, Robert W., 3,963,397.
Bessman, Samuel P.: *See*—
Thomas, Lyell J., Jr.; and Bessman, Samuel P., 3,963,380.
Better Agricultural Goals Corporation: *See*—
Williamson, Robert R., 3,962,959.
Beyersdorf, Hartwig, to GEBA-Gesellschaft fur elektronische Brandmeldeanlagen mbH & Co. Ionization analyzing air pollution, smoke and fire alarm device. 3,963,929, Cl. 250-384.000.
Bhatia, Kamlesh K.: *See*—
Cumbo, Charles C.; and Bhatia, Kamlesh K., 3,963,754.
Cumbo, Charles C.; and Bhatia, Kamlesh K., 3,963,755.
Bible, Harley V., to Robertshaw Controls Company. Internal combustion engine control system and improved pneumatically operated temperature controlled valve construction therefor or the like. 3,963,042, Cl. 137-468.000.
BICC Limited: *See*—
Moore, Alexander Joseph; Taylor, David Alexander; and Greene, David James, 3,962,781.
Bichel, Joachim H., to Leifeld & Co. Method of producing V-belt pulleys and spinning lathe for carrying out such method. 3,962,896, Cl. 72-82.000.
Bien, Alfred A.; and Glover, Robert W., to Chrysler Corporation. Locking and sealing washer apparatus. 3,962,744, Cl. 15-250.340.
Biermann, Udo Klaus Paul; and Schroder, Johann, to U.S. Philips Corporation. Method of manufacturing reaction mixtures of finely divided metals or alloys and solid perhalogenated carbon compounds. 3,963,541, Cl. 149-19.920.
Billottet, Henri: *See*—
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, 3,964,063.
Binder, Gerhard; Blumel, Harald; and Krol, Helmut, to Chemische Werke Huls Aktiengesellschaft. Production of bitumen compositions containing ethylene-α-olefin rubber. 3,963,659, Cl. 260-28.5AS.
Birks, Laverne S.; and Fatemi, Mohammad, to United States of America, Navy. Multielectrode apparatus and techniques to prepare aligned asbestos fibers on a thin substrate. 3,963,439, Cl. 23-230.0PC.
Bish, Austin W., to Lawrence Peska Associates, Inc., a part interest. Dual garment hangers. 3,963,155, Cl. 223-88.000.
Bishop, Roland Justin, Jr.: *See*—
Kasai, Paul Haruo; and Bishop, Roland Justin, Jr., 3,963,830.
Bishop, Thomas Desmond, to Deritend Engineering Company Limited, The. Apparatus for performing two or more operations on a continuous web in a single pass. 3,963,160, Cl. 226-115.000.
Black and Decker Manufacturing Company, The: *See*—
Glover, Richard Warmath; and Oldewurtel, Edward Joseph, 3,962,924.
Blackwood, Wilfred Norman; Gallagher, Finbar Joseph; Richey, Kenneth Rutherford; and Marshall, William, to Oeleq Limited. Modeling with a manually interactive computer constraint violation monitoring means. 3,963,904, Cl. 235-152.000.
Blaha, James G.; and Maher, Richard C., to Towmotor Corporation. Control means adjustably synchronizing operation of a single pump with a plurality of control valves. 3,962,871, Cl. 60-433.000.
Blakey, Rene C., to Star Paper Limited. Coated substrates production. 3,963,820, Cl. 264-134.000.
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Blume, Frank R., to United States of America, Navy. Method for determining initial velocity for a rapid fire gun. 3,962,793, Cl. 33-143.00R.
Blumel, Harald: *See*—
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Blutinger, Bernard: *See*—
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Bly, Herbert Arthur. Lever actuated captive can closure. 3,963,153, Cl. 222-541.000.
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Bodovsky, Paul W.: *See*—
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Bogel, George F., to Westinghouse Electric Corporation. Digital time delay relay utilizing logic elements. 3,963,947, Cl. 307-293.000.
Bolger, Joseph E. Motorcycle clutch with daspot. 3,963,107, Cl. 192-109.00D.
Boller, Arthur; and Scherrer, Hanspeter, to Hoffmann-La Roche Inc. Liquid crystal esters. 3,963,311, Cl. 350-160.0LC.
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Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt Scott, to Ford, Bacon & Davis Texas Incorporated. Acid gas burner and sulfur recovery system. 3,963,443, Cl. 23-262.000.
Bonis, Scott A., to Lockhead Missiles & Space Company, Inc. Semiconductor chip carrier and testing fixture. 3,963,315, Cl. 339-17.0CF.
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Borchert, Hugo E.: *See*—
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Borg-Warner Corporation: *See*—
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Borie, Jean. Test bench device for vehicles. 3,962,912, Cl. 73-117.000.
Borrello, Sebastian R., to Texas Instruments Incorporated. Detector cold shield. 3,963,926, Cl. 250-338.000.
Borsi, Jozsef: *See*—
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Borst, Gaylord M.; and Meyer, Martin H., to Outboard Marine Corporation. Power trim-tilt system. 3,962,955, Cl. 91-401.000.
Bosman, Abraham Daniel, to South African Coal, Oil and Gas Corporation Limited. Handling of hot particulate materials, such as for example, hot agglomerated coal ash and coal ash clinker. 3,962,978, Cl. 110-165.00R.
Bost, Howard W., to Phillips Petroleum Company. Oxidation of hydroxy acids produced from bacterial oxidation of paraffins. 3,963,571, Cl. 195-28.00R.
Bottcher, Jurgen: *See*—
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Bouchard, John R., to Northrop Corporation. Friction reducing bearing. 3,963,284, Cl. 308-187.000.
Bouchy, Jean C.; and Hardman, Theodore J., to McNay Equipment Company, Inc. System for the measurement of a closed air space. 3,962,916, Cl. 73-149.000.
Boughner, Robert L. Casket having improved corner brackets. 3,962,761, Cl. 27-10.000.
Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Method of removing a valve mounted in an internal combustion engine cylinder-head and actuating device for carrying out the said method. 3,963,008, Cl. 123-90.610.
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Bourdo, John Lorin, to Automated Construction Industries, Inc. Mass production line for fabricating structural building members. 3,963,395, Cl. 425-88.000.
Bourke, Patrick Terence, Earl of Mayo. Marble-faced composite surface element. 3,963,846, Cl. 428-73.000.
Boutin, Laurent. Automatic variable speed transmission. 3,962,934, Cl. 74-752.00E.
Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Record carrier for a television signal. 3,963,862, Cl. 178-6.60R.
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Boyer, Jackson S., to Sun Oil Company of Pennsylvania. Novel conveyor belts for transporting tar sands. 3,963,665, Cl. 260-31.80C.
Boyer, Walter J., to Perfection Manufacturing Company, The. Grass catcher and deflector assembly. 3,962,852, Cl. 56-202.000.
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Brady, Philip James; and Alford, Allen John, to Babb Engineering Company Limited. Rotary tool holders. 3,962,953, Cl. 90-11.00A.

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Brandenburg, Klaus, to U.S. Philips Corporation. Developing device for serial electrostatic printing. 3,962,991, Cl. 118-635.000.

Brandenstein, Manfred: *See*—
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Ernst, Horst Manfred; Brandenstein, Manfred; and Olschewski, Armin, 3,963,106.

Brandl, Josef, to Peter Ilmberger KG, Maschinen-u. Zahnradfabrik. Apparatus for spraying processing fluid on the internal surface of a green tire. 3,962,987, Cl. 118-44.000.

Branscum, Tony E.: *See*—
Buss, Kenton A.; and Branscum, Tony E., 3,962,750.

Brasko, Peter, to Aluminum Company of America. Electrochemical treatment of aluminum surfaces with an aqueous solution of hydrochloric acid and gluconic acid. 3,963,594, Cl. 204-129.950.

Brasure, Donald Eugene, to Du Pont de Nemours, E. I., and Company. Flame-retardant polyvinyl fluoride film. 3,963,672, Cl. 260-45.75B.

Bratkowski, Walter V.; and Wafer, John A., to Westinghouse Electric Corporation. Magnetic pulse generator. 3,963,948, Cl. 310-15.000.

Brattberg, Axel Wilhelm, to Saab-Scania Aktiebolag. Butterfly valve. 3,963,213, Cl. 251-306.000.

Bratzler, Karl; Doerges, Alexander; Kempf, Georg; Rudolph, Paul; and Schlauer, Johann, to Metallgesellschaft Aktiengesellschaft. Process of desulfurizing hot gases. 3,963,825, Cl. 423-223.000.

Braun Aktiengesellschaft: *See*—
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Breazeale, Billy H., to Texas Instruments Incorporated. Photoconductive detector and method of fabrication. 3,963,925, Cl. 250-338.000.

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Bressendorff, Leon Leopold Breslau, to A/S Atlas. Industrial refrigeration plants of the absorption type. 3,962,887, Cl. 62-485.000.

Bret, Gerard Marcel Marius: *See*—
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Bridgestone Tire Company Limited: *See*—
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Kaneko, Yoshio; Watabe, Yoji; Matsunaga, Tsutomu; Toki, Shigeyuki; and Iseda, Yutaka, 3,963,681.
Takusagawa, Takashi; Fujikawa, Akira; Matsuda, Akira; Kaida, Masaaki; and Yasuda, Shigeo, 3,963,887.

Brien, Andre Guy. Gravity actuated miniature switch for watch having switch actuator magnetic retaining structure. 3,963,885, Cl. 200-52.00R.

Brinson, Durwood S. Apparatus for training cutting horses. 3,962,995, Cl. 119-29.000.

British Industrial Plastics Limited: *See*—
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British Sealed Beams Limited: *See*—
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Broadie, Robert W.; Kemlage, Bernard M.; and Pogge, H. Bernard, to International Business Machines Corporation. Two stage heteroepitaxial deposition process for GaP/Si. 3,963,538, Cl. 148-175.000.

Brodie, Inc.: *See*—
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Broeker, Herbert H.: *See*—
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Brooks, William Victor Hayes, to Domtar Limited. Diaper package. 3,963,029, Cl. 128-287.000.

Brotz, Walter; Illmann, Gunther; Riedel, Alfred; and Zinnert, Friedrich, to Hoechst Aktiengesellschaft. Lubricant for polyvinyl chloride materials. 3,963,658, Cl. 260-28.50D.

Brown, Albert W., to International Telephone and Telegraph Corporation. Pilot valve operated pressure regulator. 3,963,044, Cl. 137-490.000.

Brown, David A.: *See*—
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Brown, Kenneth Robson; and Sharp, Colin Keith, to Ferranti, Limited. Signal resolving apparatus. 3,963,912, Cl. 235-189.000.

Brown, Laurence E.: *See*—
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Brown, Leon E.: *See*—
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Browning, Scott M.; and Klomp, Gregory F. Combination writing implement and flashlight. 3,963,914, Cl. 240-6.460.

Bruce, William A.; and Street, Marion W., Jr., to United States of America, Agriculture. Detection of hidden insects. 3,963,927, Cl. 250-338.000.

Brumberger, Neil A.; Auxer, Bennie C.; and Rush, Donald L., to Westinghouse Electric Corporation. Sequential occupancy release control method and apparatus for train vehicles. 3,963,201, Cl. 246-34.00R.

Bruning, William E.; and Ford, Michael J., to Omni Corporation. Grain door and method of making. 3,963,550, Cl. 156-252.000.

Brushenko, Anatoli, to GAF Corporation. Contrast of electrostatic latent images with a light flooding step. 3,963,488, Cl. 96-1.00R.

Bruzzese, Tiberio; and Ferrari, Rodolfo. Process for preparing dihydroxydiphenylmethane derivatives. 3,963,732, Cl. 260-294.80R.

Bucher, Hermann K.; and Criswell, Thomas R., to Eastman Kodak Company. Liquid crystal compositions, methods and devices. 3,963,638, Cl. 252-299.000.

Buchert, Claude-Charles. Data display panels. 3,963,326, Cl. 350-266.000.

Buchi, George Hermann; Wuest, Hans; Ohloff, Gunther; and Strickler, Hugo, to Firmenich S.A. 4-Methyl-8-vinyl-4,7- and -4,8-nonadienals. 3,963,783, Cl. 260-601.00R.

Budzich, Tadeusz. Hydrostatic transmission mixed loop system. 3,962,872, Cl. 60-453.000.

Bugaut, Andree: *See*—
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Bulich, Anthony A., to A. E. Staley Manufacturing Company. Producing pullulanase with organisms having a superior capacity to elaborate pullulanase. 3,963,575, Cl. 195-31.00R.

Bullard, Wade A.; and Stahlman, Donald B. Colorimetric indicator compositions and method of manufacture. 3,963,442, Cl. 23-253.0TP.

Bunn, Dorrance P., Jr.; and Jones, H. Blandin, to Texaco Inc. Fluid catalytic cracking. 3,963,603, Cl. 208-164.000.

Burger, Walter; and Ditscheid, Hans Leo, to Felten & Guilleaume Kabelwerke AG. Connector arrangement for coaxial cables. 3,963,321, Cl. 339-177.00E.

Burnett, John W. Transportable overbed table. 3,963,288, Cl. 312-209.000.

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Burrus, Thomas William, to RCA Corporation. Locked groove detection and correction in video disc playback apparatus. 3,963,860, Cl. 178-6.60R.

Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, to Parsons Controls Limited. Link component for trawling gear. 3,962,755, Cl. 24-201.0HL.

Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, to Parsons Controls Limited. Stopper for use in trawling gear. 3,962,810, Cl. 43-8.000.

Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, to Parsons Controls Limited. Chain component. 3,962,811, Cl. 43-8.000.

Busco, Anthony R. Multiple operating alarm systems employing oil burner flame monitoring relays. 3,964,044, Cl. 340-276.000.

Bush Boake Allen Limited: *See*—
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Bushberger, Todd E. Hand-held power cue stick chalker and talcum powder dispenser. 3,963,237, Cl. 273-19.000.

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Buss, Kenton A.; and Branscum, Tony E., to Gott Manufacturing Co., Inc. Hinge construction. 3,962,750, Cl. 16-168.000.

Buss, Stephen Alan; and Buss, Benjamin Alvin. Rotary vacuum drum filter. 3,963,623, Cl. 210-401.000.

Bussian, Ronald Wayne: *See*—
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Butts, Charles C., to Davis Walker Corporation. Dispenser for coiled elongated flexible product. 3,963,194, Cl. 242-129.000.

Buzzelli, Edward S., to Westinghouse Electric Corporation. High energy density fused salt battery and cathode for use therein. 3,963,516, Cl. 136-6.0LF.

BWG Bergwerk-und Walzwerk Maschinenbau G.m.b.H.: *See*—
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Byerley, Wilbur M.; Glatthorn, Raymond H.; and Lock, Emil P., to Westinghouse Electric Corporation. Method for repairing a heat exchanger tube. 3,962,767, Cl. 29-157.30R.

Byrum, Bernard W., Jr.: *See*—
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Caban, Angel M. Valve assembly for concrete pumps. 3,963,385, Cl. 417-517.000.

Caillaud, Andre; Charuit, Pierre; Duffau, Claude; and Ravoire, Jean, to Commissariat a l'Energie Atomique; and Compagnie des Salins du Midi et des Salines de l'Est. Apparatus for the prevention of scaling in desalination apparatus. 3,963,619, Cl. 210-256.000.

Cairncross, Allan: *See*—
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Calame, Tracy C.; and Cannon, William A., to Illinois Stoker Company. Grate bar casting for incinerator or other conveyor. 3,962,977, Cl. 110-38.000.

Caldwell, James Lewis, to Bell Telephone Laboratories, Incorporated. Parity framing of pulse systems. 3,963,869, Cl. 179-15.0BS.

Cale, Albert Duncan, Jr.; and Leonard, Charles Arthur, to A. H. Robins Company, Incorporated. Method for controlling emesis with N-(1-substituted-3-pyrrolidinyl)benzamides and thiobenzamides. 3,963,745, Cl. 260-326.50S.

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Camph, Sven Erik; and Holmgren, Kjell Ake Bertil, to Camph Engineering Company AB. Controlling the microwave heating of flowing blood as a function of heated blood temperature. 3,963,892, Cl. 219-10.55M.
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Carlson, Ronald G. Roller skate. 3,963,252, Cl. 280-11.220.
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Carruet, Valere Jean Marie; and Verspecht, Freddy Josse Melanie, to International Standard Electric Corporation. Data processing system employing one of a plurality of identical processors as a controller. 3,964,055, Cl. 340-172.500.
Casey, John A. Process and apparatus for treatment of cane sugar juice. 3,963,513, Cl. 127-11.000.
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Challet, Jacques, to Constructions Electriques R.V. Piezoelectric lighters notably for domestic appliance burners and the like. 3,963,411, Cl. 431-255.000.
Chance, Britton; Legallais, Victor; Sorge, John R.; and Graham, Norman C., Jr. Multi-channel optical time-sharing apparatus having a rotating filter wheel with position-encoding means. 3,963,351, Cl. 356-85.000.
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Charpentier, Jean; Cancian, Genevieve; and Selz, Francois, to International Standard Electric Corporation. System for transferring data between central units and controlled units. 3,964,056, Cl. 340-172.500.
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Chayer, William J. Vehicle for handling multi-furrow plough. 3,963,137, Cl. 214-501.000.
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Chernock, Stephen Peter. Unitary spark and thumb wheel. 3,963,412, Cl. 431-273.000.
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Cho, Kon Ho, to Western Electric Company, Inc. Method of precisely aligning pattern-defining masks. 3,963,489, Cl. 96-27.00R.
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Chu, Daniel Tim-Wo; and Garmaise, David Lyon, to Abbott Laboratories. Anilino derivatives of chelocardin. 3,963,774, Cl. 260-519.000.
Chu, Nan S., to Union Carbide Corporation. Water swellable poly-(alkylene oxide). 3,963,805, Cl. 260-874.000.
Church, Ralph E., to General Electric Company. Laminated structure with insulating member formed in situ thereon. 3,963,949, Cl. 310-43.000.
Chylewski, Christoph: *See—*
Marthaler, Max; Schellenberg, Matthias; Mollet, Herbert; and Chylewski, Christoph, 3,963,492.
Ciba-Geigy AG: *See—*
Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, 3,963,431.
Marthaler, Max; Schellenberg, Matthias; Mollet, Herbert; and Chylewski, Christoph, 3,963,492.
Ciba-Geigy Corporation: *See—*
Harris, Arthur; Burrows, John; and Jones, Thomas Ivor, 3,963,636.
Karrer, Friedrich; and Farooq, Saleem, 3,963,786.
L'Eplattenier, Francois; Vuitel, Laurent; and Pugin, Andre, 3,963,708.
Mory, Rudolf, 3,963,693.
Mory, Rudolf; and Muller, Rolf, 3,963,694.
Schreiber, Bruno; Seiz, Wolfgang; and Forster, Ewald, 3,963,666.
Schreiber, Bruno; Diethelm, Hermann; Habermeier, Jurgen; and Forster, Ewald, 3,963,667.
Citizen Watch Co., Ltd.: *See—*
Kushida, Hachiro; Takasugi, Tsuneji; Ikeda, Shinji; and Shiono, Takashi, 3,963,589.
Clark, Alfred James, to Motorola, Inc. Anti backlash and treadle bar linkage system. 3,964,001, Cl. 334-7.000.
Clark, George Reginald Seymour, to New Zealand Inventions Development Authority. Demountable stick. 3,963,037, Cl. 135-45.00R.

Clark, William H., to Utah Research & Development Co. Pulsed current battery charging method and apparatus. 3,963,976, Cl. 320-21.000.

Claxton, Dale H.; and Miller, Chauncey S., to TRW Inc. Analog-to-digital converters utilizing gunn effect devices. 3,964,060, Cl. 340-347.0AD.

Clayton, Jack E. Motorcycle carrier. 3,963,129, Cl. 214-86.00A.

Clayton, John Peter: *See—*
Ferres, Harry; and Clayton, John Peter, 3,963,702.

Clenet, Alain Jean-Marie, to W. R. Grace & Co. Combined extensible carrier and electrical wire sheath. 3,963,158, Cl. 224-31.000.

Cobe Laboratories, Inc.: *See—*
Hankinson, George R., 3,963,023.

Coeurderoy, Yves G., to Societe Anonyme: Poclain. Hydraulic installation with means for storing energy. 3,963,039, Cl. 137-118.000.

Coeurderoy, Yves G., to Societe Anonyme: Poclain. Method of subordinating the orientation of a grab on a public works machine to the rotation of the turrest of this machine and to the machine. 3,963,135, Cl. 214-151.000.

Cohn, David B.; Draggoo, Vaughn G.; Lacina, William B.; Brown, Laurence E.; and Stone, Merrill M., to Northrop Corporation. Arc operated Q switch for laser. 3,964,003, Cl. 331-94.50Q.

Cole, Marc. Electrolyticdialysis. 3,963,567, Cl. 204-180.00P.

Coles, John Neil; and Long, James Victor Percival, to National Research Development Corporation. Ion microprobes. 3,963,923, Cl. 250-309.000.

Colgate-Palmolive Company: *See—*
DeSalva, Salvatore Joseph; and Costello, Christopher H., 3,963,833.

Collier, Sydney Wellington. Wall rug cleaning machine. 3,962,745, Cl. 15-322.000.

Collins, Dean E., to Root-Lowell Manufacturing Co. Sprayer nozzle. 3,963,178, Cl. 239-8.000.

Collins, James D., to General Motors Corporation. Low temperature magnetic treatment of ferromagnetic materials. 3,963,533, Cl. 148-108.000.

Collins, William O. Aircraft approach and landing light system. 3,964,015, Cl. 340-26.000.

Columbiana Foundry Company: *See—*
Way, Lewis A.; and Williams, Robert C., 3,962,897.

Colyn, Roland, to Compagnie Generale d'Electricite. Device for producing electrical pulses. 3,963,945, Cl. 307-268.000.

Combustion Engineering, Inc.: *See—*
McAllister, Owen Earl, 3,962,828.

Commissariat a l'Energie Atomique: *See—*
Caillaud, Andre; Charuit, Pierre; Duffau, Claude; and Ravoire, Jean, 3,963,619.
Frenkel, Jean-Mathieu; Pelchat, Jacques; and Weisz, Michel, 3,963,534.
Lecocq, Alfred, 3,963,564.

Commonwealth Scientific and Industrial Research Organization: *See—*
Swift, Jean Drummond; Hawthorne, David Geoffrey; Loft, Bryan Clarence; and Solomon, David Henry, 3,963,511.
Swift, Jean Drummond; Hawthorne, David Geoffrey; Loft, Bryan Clarence; and Solomon, David Henry, 3,963,512.

Communications Satellite Corporation (Comsat): *See—*
DiFonzo, Daniel F., 3,963,990.

Compagnia Tecnica Industrie Petrolie S.p.A.: *See—*
Giacobbe, Francesco; and Longobardi, Giampiero, 3,963,581.

Compagnie des Salins du Midi et des Salines de l'Est: *See—*
Caillaud, Andre; Charuit, Pierre; Duffau, Claude; and Ravoire, Jean, 3,963,619.

Compagnie Generale d'Electricite: *See—*
Colyn, Roland, 3,963,945.
Jacob, Louis, 3,963,995.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Dalmasso, Ginette Laure, 3,964,027.

Compagnie Internationale pour l'Informatique: *See—*
Ducrocq, Claude; Hacques, Robert; Hubert, Maurice; and Touze, Robert, 3,964,088.

Concast AG: *See—*
Marti, Heinrich; and Schmid, Markus, 3,963,069.

Conley, Cecil. Operator alerting device. 3,964,045, Cl. 340-279.000.

Conlin, John R., Jr.: *See—*
Means, Donald J.; and Conlin, John R., Jr., 3,962,812.

Connor, Harry F. Nail extractor tool. 3,963,215, Cl. 254-26.00R.

Conrad, Roddy Merl; and Holland, Lyman Lyle, to Du Pont de Nemours, E. I., and Company. Large denier polyethylene terephthalate monofilaments having good transverse properties. 3,963,678, Cl. 260-75.00T.

Consolidated Packaging Corporation: *See—*
Frum, Carlos M., 3,963,168.

Constructions Electriques R.V.: *See—*
Challet, Jacques, 3,963,411.

Consupak, Inc.: *See—*
Pollock, Donald M.; and Hallowell, Fulton W., 3,963,404.

Container Corporation of America: *See—*
Gardner, Jeffrey M., 3,963,169.
Kipp, Michael A., 3,963,121.

Contento, Jerry. Horse racing board game apparatus. 3,963,243, Cl. 273-134.0CH.

Continental Can Company, Inc.: *See—*
Zavasnik, Fred J., 3,963,399.

Continental Conveyor and Equipment Company: *See—*
Younger, Joseph J., 3,963,114.

Continental Hair Products, Inc.: *See—*
Tomaro, Patrick M., 3,963,179.

Control Data Corporation: *See—*
Lewis, Raymond M., 3,963,882.
Mayer, William N., 3,964,050.

Conway, Michael J.: *See—*
Hughes, Roderick E.; and Conway, Michael J., 3,963,403.

Cook, Dudley W., to H. D. Lee Company, Inc., The. Zipper fly construction for garments. 3,962,729, Cl. 2-234.000.

Cooke, Barbara M., administrator: *See—*
Cooke, Melvin B., deceased; and Pritchard, Eric Kaiser, 3,962,752.

Cooke, George A.; and Houlihan, William J., to Sandoz, Inc. Tricyclic furo-quinazolinones. 3,963,717, Cl. 260-251.0QB.

Cooke, Melvin B., deceased (by Cooke, Barbara M., administrator); and Pritchard, Eric Kaiser, to Innovative Seafood Systems, Inc. Method and apparatus for removing meat from crabs. 3,962,752, Cl. 17-71.000.

Cooley, Denton A.; Reed, Charles C.; and Sharp, Russell G., to Texas Medical Products, Inc. Suction wand. 3,963,028, Cl. 128-276.000.

Coombes, Robert F., to Curtis Nuclear Corporation. Labelled cardiotonic glycosides for use in radioimmunoassay. 3,963,697, Cl. 260-210.500.

Cooper, Barry John: *See—*
Acres, Gary James Keith; and Cooper, Barry John, 3,963,827.

Cooper, Cleveland N., to Pandjiris Weldment Co., The. Pipe positioning, rotating and fitting apparatus for welding. 3,963,231, Cl. 269-45.000.

Cooper, David J.; and Pfeiffer, Francis R., to SmithKline Corporation. Tetradeoxyneamine and derivatives thereof. 3,963,695, Cl. 260-210.0AB.

Copal Company Limited: *See—*
Satake, Yoshihiro, 3,963,970.

Coral Chemical Company: *See—*
Smollett, Thomas J.; and Stipanovic, Bozidar, 3,963,530.

Corbett, Andrew Neville. Attaching a tooth crown to un-parallel tooth root systems. 3,962,787, Cl. 32-15.000.

Corompt, Antoine, to Bennes Marrel. Plant for the compression of garbage. 3,962,965, Cl. 100-99.000.

Corson, Frederick P.: *See—*
Evani, Syamalarao; and Corson, Frederick P., 3,963,684.

Cospen, Jean; and Baumann, Bernard, to Cebal GP. Method for hermetically sealing a rigid panel. 3,963,814, Cl. 264-23.000.

Costello, Christopher H.: *See—*
DeSalva, Salvatore Joseph; and Costello, Christopher H., 3,963,833.

Cota, Marlo E.; and Taylor, Jerry A., to Motorola, Inc. Pressure sensing method and apparatus for gases. 3,963,043, Cl. 137-487.500.

Cotton Incorporated: *See—*
LeBlanc, Destin A.; and LeBlanc, Robert Bruce, 3,963,437.

Cottrell, Arnold George, to Imperial Chemical Industries Limited. Surface treatment of particulate solids. 3,963,627, Cl. 252-4.000.

Couchoud, Paul, to Rhone-Poulenc-Textile. Non-inflammable filaments comprising acrylonitrile/vinylidene chloride copolymers. 3,963,790, Cl. 260-898.000.

Coucoulas, Alexander, to Western Electric Company, Inc. Bonding of dissimilar workpieces to a substrate. 3,964,093, Cl. 357-70.000.

Couder, Alain Audre; and Lebizay, Gerald, to International Business Machines Corporation. Time-division multiplex switching system. 3,963,870, Cl. 179-15.0AT.

Coulter Electronics, Inc.: *See—*
Coulter, Wallace H., 3,963,984.
Hogg, Walter R., 3,963,606.
Hogg, Walter R., 3,963,983.
Proni, Oscar; Melnick, Loran Vinson; and Henderson, William Taylor, 3,963,148.

Coulter, Wallace H., to Coulter Electronics, Inc. Method and system for cleaning an aperture in a particle study device. 3,963,984, Cl. 324-71.0CP.

Courtney, Robert L.: *See—*
Anderson, D. Richard; Courtney, Robert L.; and Harrah, Larry A., 3,963,826.

Covert, Eugene E.: *See—*
Haldeman, Charles W.; and Covert, Eugene E., 3,963,515.

Cowen, Arthur T., III. Combined carrying bag and racket carrier. 3,963,103, Cl. 190-52.000.

Cox, Joe Warren. Shelf-adjusting stair. 3,962,838, Cl. 52-183.000.

Coxe, Frank S.; Maxey, Lyle A.; and Wahl, David P., to Northrop Corporation. Roll reference system for vehicles utilizing optical beam control. 3,963,195, Cl. 244-3.110.

Craford, Magnus George; and Keune, David Lee, to Monsanto Company. Luminescent solid state status indicators. 3,964,039, Cl. 340-248.00A.

Crawford, John T., to Towmotor Corporation. Differential mounting and wheel drive arrangement. 3,963,089, Cl. 180-75.000.

Creager, Wade E.; and Sheppard, Albert P., to Creager, Wade E. Foot actuated electronic organ. 3,962,945, Cl. 84-1.010.

Crego, John B., to Sperry Rand Corporation. Windguard for grain distributor. 3,963,112, Cl. 198-72.000.

Crescent Metal Products, Inc.: *See—*
Baggott, George T., 3,963,125.

Crisp, David John, to Beecham Group Limited. Applicator device. 3,963,357, Cl. 401-191.000.

Criswell, Thomas R.: *See—*
Bucher, Hermann K.; and Criswell, Thomas R., 3,963,638.

Crockett, Lou Anne. Bedsheeting arrangement. 3,962,739, Cl. 5-334.00C.

Crompton & Knowles Corporation: *See*—
Dion, Raymond F., 3,963,060.

Crooks, Horatio Nelson, to RCA Corporation. Disc record groove skipper apparatus. 3,963,861, Cl. 178-6.60R.

Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 4-Alkyl-1,2-dimethyl-3,5-diphenylpyrazolium salts and derivatives thereof as fungicidal agents. 3,963,741, Cl. 260-311.000.

Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 1,2-Dialkyl-3,4,5-trisubstituted pyrazolium salts as herbicidal agents. 3,963,742, Cl. 260-311.000.

Cruzen, Harry F.; and Gresham, Robert W., to Besser Company. Cementitious product making system with product height gauging mechanism. 3,963,397, Cl. 425-141.000.

Culbertson, Billy M., to Ashland Oil, Inc. Trialkylammonium -N-[β(1-aziridinyl)] propionoylimines. 3,963,703, Cl. 260-239.00E.

Cumbo, Charles C.; and Bhatia, Kamlesh K., to Du Pont de Nemours, E. I., and Company. 2-Vinyl-5-methyl-1,3-dioxane. 3,963,754, Cl. 260-340.700.

Cumbo, Charles C.; and Bhatia, Kamlesh K., to Du Pont de Nemours, E. I., and Company. Mixture of 2(2'-propanal)-5-methyl-1,3-dioxane and 2(3'-propanal)-5-methyl-1,3-dioxane. 3,963,755, Cl. 260-340.700.

Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. Magnesium halide derivatives of tetrahydroquinolines. 3,963,722, Cl. 260-283.00R.

Curtis, George C. Time delayed shut-down circuit for recirculation pump. 3,963,375, Cl. 417-12.000.

Curtis Nuclear Corporation: *See*—
Coombes, Robert F., 3,963,697.

Curtiss-Wright Corporation: *See*—
De Feo, Angelo; Kulina, Mark R.; and Norwood, Earl B., 3,963,283.
Jones, Charles; and Woodier, George H., 3,963,387.

D. Swarovski & Co., Glasschleiferei: *See*—
Schwab, Kurt, 3,963,309.

Daghe, Joseph L.: *See*—
Hackman, Frank C.; Luckenbill, Lawrence F.; and Daghe, Joseph L., 3,963,214.

Daicel, Ltd.: *See*—
Ishi, Toshiharu; Asahi, Akira; Fujita, Hiroaki; Sato, Takeshi; and Urabe, Nobusuke, 3,963,773.

Daiichi Seiyaku Co., Ltd.: *See*—
Ueno, Katsujiro; Sato, Makoto; Arimoto, Masahiro; Kojima, Hiroshi; Yamasaki, Terukiyo; and Sakurai, Takeo, 3,963,727.

Dake, Roger O.: *See*—
Dooley, James P.; and Dake, Roger O., 3,962,770.

Dalmasso, Ginette Laure, to Compagnie Honeywell Bull (Societe Anonyme). Apparatus and method for recording and using microprogrammes in a data processing system. 3,964,027, Cl. 340-172.500.

D'Amico, Anthony J. Fence. 3,963,219, Cl. 256-24.000.

Damitz, Vernon. Cushion control accessory for pneumatic or hydraulic cylinders. 3,963,045, Cl. 137-505.130.

D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, to Pennwalt Corporation. Polymer crosslinking with coupled peroxides. 3,963,670, Cl. 260-46.50G.

Danna, Peter A, to Olin Corporation. Electrode assembly for an electrolytic cell. 3,963,595, Cl. 204-258.000.

Danylik, Victor: *See*—
Patterson, Harold A.; and Danylik, Victor, 3,963,556.

Dardenne-Ankringa, Walter, Jr., to Chevron Research Company. Oxidation process for improving the environmental quality of water containing sulfur and/or inorganic sub-six-sulfur-containing impurities. 3,963,611, Cl. 210-63.00R.

Das, Santanu, to North Electric Company. Encoding scheme for failure detection in random access memories. 3,963,908, Cl. 235-153.0AM.

da Silva, Herman: *See*—
Van Duuren, Hendrik Cornelis Anthony; and da Silva, Herman, 3,963,867.

Dattilo, Donald P. Temperature controlled animal house. 3,962,993, Cl. 119-19.000.

Daubman, Edward A.; and Sherlock, John W., to Ametek, Inc. Feedcone with accelerator vanes for imperforate basket. 3,963,175, Cl. 233-29.000.

Dauenhauer, William J.: *See*—
Gossett, Charles W.; and Dauenhauer, William J., 3,963,612.

Daum, Hermann: *See*—
Liepold, Adolf; Daum, Hermann; and Lindner, Helmut, 3,962,851.

Dauphinee, Thomas M., to Canadian Patents and Development Limited. Liquid conductivity measuring apparatus. 3,963,979, Cl. 324-30.000.

Dauwalder, Fred R., to Caterpillar Tractor Co. Mounting bracket. 3,963,065, Cl. 151-41.760.

Davidson, Dekkers H. Movable bulkhead with guiding and overcanting prevention means. 3,962,735, Cl. 4-172.120.

Davies, Barry J., to Canron Limited. Reinforced cast product and method of making. 3,963,450, Cl. 29-191.400.

Davila, Jose E.: *See*—
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,962,845.

Davis, Jerry P., to Thermo Electron Corporation. Solar steam generator. 3,962,873, Cl. 60-641.000.

Davis, Lee A., to ITE Imperial Corporation. Target reset mechanism. 3,964,008, Cl. 335-272.000.

Davis Walker Corporation: *See*—
Butts, Charles C., 3,963,194.

Davitt, H. James, to Sun Oil Company of Pennsylvania. Recovery of bitumen from aqueous streams via superatmospheric pressure aeration. 3,963,599, Cl. 208-11.0LE.

Dawson, Peter Leonard; and Rothwell, Michael Tom, to Lever Brothers Company. Dishwashing compositions. 3,963,635, Cl. 252-142.000.

De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See*—
Van Duuren, Hendrik Cornelis Anthony; and da Silva, Herman, 3,963,867.

Dean, Frank J., to Tempmaster Corporation. Vertical discharge slot diffuser with high induction ratio. 3,962,960, Cl. 98-40.00C.

Decks, Incorporated: *See*—
Carroll, Frank E., 3,962,841.

Deering Milliken Research Corporation: *See*—
Stark, Daniel C., 3,963,428.

De Feo, Angelo; Kulina, Mark R.; and Norwood, Earl B., to Curtiss-Wright Corporation. Emergency bearing. 3,963,283, Cl. 308-78.000.

Dehner, Bernard J.: *See*—
Good, Thomas W.; and Dehner, Bernard J., 3,962,820.

Deissmann, Walter: *See*—
Winter, Gerhard; Deissmann, Walter; Gutsche, Walter; and Woditsch, Peter, 3,963,585.

de Keyzer, Cornelius J., to Rank Xerox Ltd. Camming systems. 3,963,343, Cl. 355-8.000.

Dekker, Bob: *See*—
Spadini, Gianfranco Luigi; and Dekker, Bob, 3,963,649.

Dellit, Richard John: *See*—
Hutton, Albert John; Hutton, Allen William; and Dellit, Richard John, 3,962,935.

Deloy, Joseph T.; and Selch, Grant J., to Nabisco, Inc. Food reclaiming system. 3,963,181, Cl. 241-76.000.

de Lyra, Rose T. Permanent envelope. 3,963,174, Cl. 229-80.000.

de Magondeaux, Maurice, to Sofiltra, Societe Industrielle de Filtration. Choked condition detector for an air-purifying device. 3,963,891, Cl. 200-308.000.

DeMarinis, Robert M., to SmithKline Corporation. Cyanomethyl sulfinyl- and sulfonyl-acetamido cephalosporins. 3,963,709, Cl. 260-243.00C.

DeMarinis, Robert M., to SmithKline Corporation. Cyanomethyl sulfinyl- and sulfonyl-acetamido cephalosporins. 3,963,711, Cl. 260-243.00C.

Demo, Joseph J., Jr., to Du Pont de Nemours, E. I., and Company. Fe, Cr ferritic alloys containing Al and Nb. 3,963,532, Cl. 148-37.000.

Dennison Manufacturing Company: *See*—
Robinson, Eric Richard, 3,962,730.

Deritend Engineering Company Limited, The: *See*—
Bishop, Thomas Desmond, 3,963,160.

DeRosa, John. Self-sealing fuel line. 3,963,055, Cl. 138-140.000.

DeSalva, Salvatore Joseph; and Costello, Christopher H., to Colgate-Palmolive Company. Antiperspirant composition and method containing a dihydro-benzofuran and an astringent metal salt. 3,963,833, Cl. 424-68.000.

DeSoto, Inc.: *See*—
Sekmakas, Kazys, 3,963,663.

Deutsche Babcock & Wilcox Aktiengesellschaft: *See*—
Schiemichen, Peter, 3,962,877.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Oswald, Gunter; and Reus, Josef, 3,963,510.

Dewhirst, Geoffrey Wilson, to Thomson Shepherd and Company Limited. Method of making pile fabrics and the pile fabric made thereby. 3,963,057, Cl. 139-2.000.

Dewhirst, Geoffrey Wilson, to Thomson Shepherd and Company Limited. Carpet looms. 3,963,058, Cl. 139-2.000.

Deyrup, Edward Johnson, to Du Pont de Nemours, E. I., and Company. Process for electroplating polyoxymethylene. 3,963,590, Cl. 204-30.000.

Diamond Shamrock Corporation: *See*—
Hlynsky, Alex; Griggs, Jan M.; and Osgood, Edmond R., 3,963,751.

Diana, Guy D., to Sterling Drug Inc. 1-Phenyl-3-azacarbocyclic-ureas. 3,963,748, Cl. 260-326.470.

Dias, Francesco: *See*—
Nickel, Hubertus; Luhleich, Hartmut; and Dias, Francesco, 3,963,651.

Dickerson, Arthur F., to Hughes Aircraft Company. High voltage system with self-test circuitry. 3,964,020, Cl. 340-146.0AG.

Diethelm, Hermann: *See*—
Schreiber, Bruno; Diethelm, Hermann; Habermeier, Jurgen; and Forster, Ewald, 3,963,667.

Dietrich, Rolf, to Hoffmann-La Roche Inc. Article with a lyophilized immunoreactive self-adhering coating. 3,963,441, Cl. 23-253.00R.

DiFonzo, Daniel F., to Communications Satellite Corporation (Comsat). Interference reduction circuit. 3,963,990, Cl. 325-476.000.

Dimmer, Donald J., to Hydra-Mac, Inc. Front-end skid steer loader. 3,963,131, Cl. 214-140.000.

Dinning, Robert W.: *See*—
Elliott, J. Kelly; and Dinning, Robert W., 3,963,377.

Dion, Raymond F., to Crompton & Knowles Corporation. Shuttle drive for a narrow ware loom. 3,963,060, Cl. 139-137.000.

Ditscheid, Hans Leo: *See*—
Burger, Walter; and Ditscheid, Hans Leo, 3,963,321.

Diversified Interests, Inc.: *See—*
Inbody, Melvin R., 3,963,260.
DiVeto, Hilliard R., to Burroughs Corporation. Listing machine roll holder. 3,963,188, Cl. 242-55.200.
Dr. -Ing. H.c.F. Porsche Aktiengesellschaft: *See—*
Soffge, Friedhelm, 3,962,747.
Doerges, Alexander: *See—*
Bratzler, Karl; Doerges, Alexander; Kempf, Georg; Rudolph, Paul; and Schlauer, Johann, 3,963,825.
Doerner, William A., to Du Pont de Nemours, E. I., and Company. Rotary heat engine powered single fluid cooling and heating apparatus. 3,962,874, Cl. 60-669.000.
Doherty, George O. P.; and Fuhr, Kenneth H., to Eli Lilly and Company. Lower alkylsulfonyl 2-amino, 3-nitro pyridines. 3,963,734, Cl. 260-294.80F.
Doi, Tadashi; Sekido, Isao; and Tamaki, Ryoichi, to Kao Soap Co., Ltd. Asphalt having high adhesion strength and its preparation. 3,963,509, Cl. 106-273.00R.
Doktor, Benjamin, deceased; and by Doktor, Henrietta, administratrix. Terminal block construction. 3,963,305, Cl. 339-274.000.
Doktor, Henrietta, administratrix: *See—*
Doktor, Benjamin, deceased; and Doktor, Henrietta, administratrix, 3,963,305.
Domtar Limited: *See—*
Brooks, William Victor Hayes, 3,963,029.
Hayes, George T., 3,963,064.
Hitchmough, John R.; and Wetmore, Clyde Arthur, 3,963,843.
Lapointe, Joseph A.; and Sheel, Ronald S., 3,962,799.
LaPointe, Joseph A., 3,962,966.
Donley, Miller & Nowikas, Inc.: *See—*
Nowikas, Walter M., 3,963,094.
Donnadille, Bernard, to C.G.R.-Mev. Shutter designed to block high-energy particle beams. 3,963,935, Cl. 250-514.000.
Donovan, Robert W.; Kolster, Harvey L.; Broeker, Herbert H.; and Bailey, George W., to Hallmark Cards, Incorporated. Wall mounted display system. 3,963,913, Cl. 240-2.0AD.
Dooley, James P.; and Dake, Roger O., to A. B. Chance Company. Elbow puller. 3,962,770, Cl. 29-203.00H.
Doormaid, Inc.: *See—*
Kienlen, Loren C.; and Poppler, Jack H., 3,962,826.
Dornte, Ralph William, to ESB Incorporated. Reaction product of polyalkylene imine and epoxy, halo, ethylenic substituted difunctional compounds. 3,963,806, Cl. 260-874.000.
Dorr, Karl Heinz; Weber, Waldemar; Grimm, Hugo; and Rowedder, Gustav, to Metallgesellschaft Aktiengesellschaft. Catalytic reactor having annular catalyst tray means. 3,963,423, Cl. 23-288.00R.
Doss, Richard C.; and Jones, Faber B., to Phillips Petroleum Company. Adhesive formulation improved with solid fillers. 3,963,850, Cl. 428-286.000.
Double E Company, Inc.: *See—*
Flagg, Richard Edward, 3,963,250.
Dow Chemical Company, The: *See—*
Evani, Syamalarao; and Corson, Frederick P., 3,963,684.
Miller, Lewis S., 3,963,798.
Pruitt, Malcolm E.; and Lovett, Joe B., 3,963,690.
Strojny, Edwin J., 3,963,759.
Dowd, Daniel J., to Westvaco Corporation. Method and apparatus for pre-registration of a multiple cylinder rotary printing press. 3,963,902, Cl. 235-92.0MP.
Down, Dennis Llewellyn Richard. Dual purpose trailer towing attachment. 3,963,264, Cl. 280-415.00A.
Downs, Diarmuid, to Ricardo & Co. Engineers (1927) Ltd. Combustion chamber arrangements for I.C. engines. 3,963,003, Cl. 123-32.00K.
Drabowitch, Serge, to Thomson-CSF. Corrugated horn having means for extracting divergence-measuring modes. 3,964,070, Cl. 343-786.000.
Draggoo, Vaughn G.: *See—*
Cohn, David B.; Draggoo, Vaughn G.; Lacina, William B.; Brown, Laurence E.; and Stone, Merrill M., 3,964,003.
Dravo Corporation: *See—*
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Dresser Industries, Inc.: *See—*
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Spriggs, Dennis Mitchel, 3,963,074.
Walker, Ross W., 3,963,080.
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Ducrocq, Claude; Hacques, Robert; Hubert, Maurice; and Touze, Robert, to Compagnie Internationale pour l'Informatique. Multi-unit equipment maintenance system. 3,964,088, Cl. 340-172.500.
Duel, Don M., to Motorola, Inc. Time delay control mechanism. 3,962,973, Cl. 102-80.000.
Duffau, Claude: *See—*
Caillaud, Andre; Charuit, Pierre; Duffau, Claude; and Ravoire, Jean, 3,963,619.
Dufour, Serge P., to Societe Anonyme: Poclain. Public works appliance. 3,963,132, Cl. 214-142.000.
Dukess, Joseph. High frequency heat sealing container closure. 3,963,845, Cl. 428-64.000.
Dumesnil, Maurice E.; and Schreier, Ulrich, to Technology Glass Corporation. Lead-zinc-boron sealing glass compositions. 3,963,505, Cl. 106-47.00R.
Dunlap, Harold E., to Lodding Engineering Corporation. Slurry distributor. 3,963,562, Cl. 162-343.000.
Dunn, John W., to Owens-Corning Fiberglas Corporation. Method of making glass fiber mats and controlling pressure drop across web by varying perforated plate beneath web. 3,962,753, Cl. 19-156.300.
Du Pont de Nemours, E. I., and Company: *See—*
Aitken, Walter Brent; Bussian, Ronald Wayne; Menson, Robert Carroll; and Narayanswamy, Venkatachalam, 3,963,578.
Aufdermarsh, Carl Albert, Jr., 3,963,710.
Baer, Donald R.; Cairncross, Allan; and Smith, Michael, 3,963,715.
Brasure, Donald Eugene, 3,963,672.
Conrad, Roddy Merl; and Holland, Lyman Lyle, 3,963,678.
Cumbo, Charles C.; and Bhatia, Kamlesh K., 3,963,754.
Cumbo, Charles C.; and Bhatia, Kamlesh K., 3,963,755.
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Su, Aaron Chung Liong, 3,963,801.
Takeshita, Tsuneichi, 3,963,772.
Tullio, Victor, 3,963,418.
Durand-Vienne, Robert Rene, to Agence Nationale de Valorisation de la Recherche (ANVAR). Device for instantaneous decimal credibility check for data processing. 3,963,907, Cl. 235-153.00B.
Dwight, Bernard L. Line tensioning system. 3,963,217, Cl. 254-185.00R.
Dynamit Nobel Aktiengesellschaft: *See—*
Lenz, Arnold; and Rogler, Walter, 3,963,831.
Steffen, Klaus-Dieter, 3,963,739.
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E. I. Du Pont de Memours and Company: *See—*
Straub, Robert Michael, 3,963,647.
E. R. Squibb & Sons, Inc.: *See—*
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Eastman Kodak Company: *See—*
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Irick, Gether, Jr.; and Kelly, Charles A., 3,963,738.
Pickering, Charles E., 3,964,081.
Trevoy, Donald J., 3,963,498.
Eaton, Sargent Sheffield, Jr., to RCA Corporation. Memory cell. 3,964,031, Cl. 340-173.00R.
Ebata, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. Continuous coupling element for slide fasteners. 3,962,756, Cl. 24-205.16C.
Eby, Devon L., to Tyme and Tydings Inc. Rotating message device. 3,962,806, Cl. 40-33.000.
Eckell, Wolfgang: *See—*
Staudt, Heinrich; Eckell, Wolfgang; Lehmann, Hartmut; Sontheimer, Karl; and Hofmann, Eberhard, 3,963,014.
Eckerbom, Gunnar; and Nilsson, Ove, to Aktiebolaget Tudor. Process for the manufacture of lead storage battery electrodes and apparatus for carrying out the process. 3,963,517, Cl. 136-27.000.
Eckert, Konrad, to Robert Bosch G.m.b.H. Fuel supply system. 3,963,005, Cl. 123-119.00R.
Eckle, Otto; and Grzegorz, Hans, to KOMET Stahlhalter-und Werkzeugfabrik, Robert Breuning GmbH. Boring tool for working bores of small diameter. 3,963,366, Cl. 408-199.000.
Ed. Geistlich Sohne A.G. fur Chemische Industrie: *See—*
Pfirrmann, Rolf Wilhelm, 3,963,706.
Edelmann, Gerhard: *See—*
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Edwards, Roger; Evans, William Joshua; Grant, Wesley Norman; and Murphy, Bernard Thomas, to Bell Telephone Laboratories, Incorporated. Method for fabricating oxide isolated integrated circuits. 3,962,779, Cl. 29-577.000.
Egyt Gyogyszervegyeszeti Gyar: *See—*
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Ehata, Senzou: *See—*
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Eichler, Clifton Joe, to Loyd W. Richardson Construction Company. Movable guide bar. 3,963,279, Cl. 308-3.00R.
Eigenbrode, George Thomas; and Evans, Robert Franklin, to Du Pont de Nemours, E. I., and Company. Zero force edge connector block. 3,963,317, Cl. 339-74.00R.
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Eli Lilly and Company: *See—*
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Elias, James A., deceased (by Elias, June G., executrix) Newby, John R.; and Pierson, Marvin B., to Armco Steel Corporation. Cold rolled, ductile, high strength steel strip and sheet and method therefor. 3,963,531, Cl. 148-31.500.

Elias, June G., executrix: *See—*
Elias, James A., deceased; Newby, John R.; and Pierson, Marvin B., 3,963,531.

Elliott, J. Kelly; and Dinning, Robert W., to Schlumberger Technology Corporation. Pneumatically powered pump system. 3,963,377, Cl. 417-90.000.

Ellis, Robert G., to Atlas Pacific Engineering Company. Machine for seed celling apples. 3,962,963, Cl. 99-544.000.

Elslager, Edward Faith, to Parke, Davis & Company. Benzo and benzothiopyranoindazole N-oxides. 3,963,740, Cl. 260-310.00C.

Emerson Electric Co.: *See—*
Baysinger, Robert L., 3,963,410.

Emery, Arthur: *See—*
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Emery Industries, Inc.: *See—*
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Emmerson, Calvin W., to General Motors Corporation. Turbine cooling. 3,963,368, Cl. 415-115.000.

Emoto, Kazuhiro: *See—*
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Endo, Hiroshi: *See—*
Shibuya, Atsumi; Sugita, Chokichi; and Endo, Hiroshi, 3,963,056.

Engebretsen, Einar O., to Hobart Corporation. Compactor cycle control. 3,962,964, Cl. 100-51.000.

Enger, Carl C. Impermeable silicone composition. 3,963,677, Cl. 260-28.50D.

Enomoto, Akio; and Tadakuma, Yuji. Automatic tax calculating apparatus. 3,963,910, Cl. 235-156.000.

Enomoto, Yasushige: *See—*
Ezaki, Toshiyuki; Furukawa, Kunio; and Enomoto, Yasushige, 3,963,815.

Environeering, Inc.: *See—*
Huppke, Glen P., 3,963,463.

Eriksson, Mats Erik, to Hiab-Foco Aktiebolag. Blocking arrangement in hydraulically operated cranes. 3,963,127, Cl. 212-8.00R.

Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company, B.V. Bearing and clutch diaphragm assembly. 3,963,105, Cl. 192-98.000.

Ernst, Horst Manfred; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company, B.V. Clutch disengager with sliding sleeve. 3,963,106, Cl. 192-98.000.

Ernsthausen, Roger E.: *See—*
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ESB Incorporated: *See—*
Dornte, Ralph William, 3,963,806.

Esbjornsson, Stig Uno Ingvar, to Aktiebolaget Ljungmans Verkstader. Liquid-dispensing installation. 3,963,146, Cl. 222-59.000.

Esbeli, Michael. Heat exchanger. 3,962,888, Cl. 62-499.000.

Esseluhn, Werner F.: *See—*
Fegley, Charles R.; and Esseluhn, Werner F., 3,963,145.

Estell, Gertrude Althea. Toy automobile apparatus. 3,963,262, Cl. 280-231.000.

Estradier, Francoise: *See—*
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Etat Francais: *See—*
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Etat Francais, represented by Delegation Ministerielle pour l'Armement: *See—*
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Ethicon, Inc.: *See—*
Hunter, Alastair W., 3,963,031.

Ettenberg, Michael; and Kressel, Henry, to RCA Corporation. Method of making electroluminescent semiconductor devices. 3,963,536, Cl. 148-171.000.

Etudes et Fabrications Aeronautiques: *See—*
Pravaz, Marcel, 3,963,199.

Eugene, Emmanuel, to Lawrence Peska Associates, Inc., a part interest. Push-button T.V. tuner. 3,964,002, Cl. 334-7.000.

Evani, Syamalarao; and Corson, Frederick P., to Dow Chemical Company, The. Vinyl benzyl ethers and nonionic water soluble thickening agents prepared therefrom. 3,963,684, Cl. 526-303.000.

Evans, Orde R. Centralizer for elastomer coated blast joint. 3,963,075, Cl. 166-241.000.

Evans, Robert Franklin: *See—*
Eigenbrode, George Thomas; and Evans, Robert Franklin, 3,963,317.

Evans, William Joshua: *See—*
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Evolution S.A.: *See—*
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Exel Oy: *See—*
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Eysn, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Metallurgical vessel, in particular a converter. 3,963,223, Cl. 266-241.000.

Ezaki, Toshiyuki; Furukawa, Kunio; and Enomoto, Yasushige, to Nippon Steel Corporation; and Harima Refractory Co., Ltd. Method of lining molten metal vessels and spouts with refractories. 3,963,815, Cl. 264-30.000.

F. D. Farnum Co.: *See—*
Youngberg, Charles A., 3,963,408.

Fabry, Pierre: *See—*
Kleitz, Michel; Fabry, Pierre; and Fouletier, Jacques, 3,963,597.

Fairmont Foods Company: *See—*
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Farkas, Lajos; Kasztreiner, Endre; Andrasi, Ferenc; Borsi, Jozsef; Elekes, Istvan; and Polgari, Istvan, to Egyt Gyogyszervegyeszeti Gyar. Acylated 2-aminothiazole derivatives. 3,963,735, Cl. 260-294.80D.

Farone, Eugene Richard, to Lubrizol Corporation, The. Curable water-base compositions. 3,963,657, Cl. 260-29.4UA.

Farooq, Saleem: *See—*
Karrer, Friedrich; and Farooq, Saleem, 3,963,786.

Fassauer, Arthur L., to Fassauer Industries, Inc. Granular material conveyor. 3,963,149, Cl. 222-142.000.

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Fatemi, Mohammad: *See—*
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Fauchez, Jean-Jacques, to Anvar, Agence Nationale de Valorisation de la Recherche. Method of and apparatus for selectively controlling a plurality of remotely located loads. 3,964,023, Cl. 340-147.0PC.

Faulkner, Ben V. Method of preventing well bore drilling fluid overflow and formation fluid blowouts. 3,963,077, Cl. 166-315.000.

Fedele, Margaret T. Device for moving or positioning a patient in a bed. 3,962,736, Cl. 5-81.00R.

Federal Laboratories, Inc.: *See—*
Knapp, John S., 3,963,770.

Fedrigo, A. Fred. Cam lock and method for making same. 3,963,360, Cl. 403-14.000.

Fedrowitz, Walter; and Frieser, Rudolf G., to International Business Machines Corporation. Oxidation of chromium surfaces. 3,963,528, Cl. 148-6.14R.

Fegley, Charles R.; and Esseluhn, Werner F. Anti-burglary chemical dispensing device. 3,963,145, Cl. 222-5.000.

Fein, Michael E.; Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., to Owens-Illinois, Inc. Gas discharge device dielectric containing selenium, tellurium and/or polonium. 3,963,633, Cl. 252-63.200.

Feldheim, Robert J. Teaching device particularly adapted for the game of blackjack. 3,962,800, Cl. 35-8.00B.

Feldman, Martin; and White, Donald Lawrence, to Bell Telephone Laboratories, Incorporated. Inspection of masks and wafers by image dissection. 3,963,354, Cl. 356-168.000.

Fella-Werke G.m.b.H.: *See—*
Liepold, Adolf; Daum, Hermann; and Lindner, Helmut, 3,962,851.

Felten & Guilleaume Kabelwerke AG: *See—*
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Fengler, Harald: *See—*
Hujer, Friedrich; Weinert, Volker; and Fengler, Harald, 3,963,344.

Ferara, James T., to Molins Machine Company, Inc. Cutoff mechanism. 3,962,942, Cl. 83-311.000.

Fergason, James L.; and Werth, Duane E., to Hoffmann-La Roche Inc. Liquid crystal display assembly. 3,963,324, Cl. 350-160.0LC.

Ferguson, Fred Eugene, to O. M. Scott & Sons Company. Fertilizer composition containing ferrous salt. 3,963,118, Cl. 206-84.000.

Ferranti, Limited: *See—*
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Ferrari, Rodolfo: *See—*
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Ferres, Harry; and Clayton, John Peter, to Beecham Group Limited. Phthalide penicillin ester intermediates. 3,963,702, Cl. 260-239.100.

Ferres, Harry, to Beecham Group Limited. Penicillin esters. 3,963,704, Cl. 260-239.100.

Fex, Hans Jacob: *See—*
Hogberg, Knut Bertil; Fex, Hans Jacob; Konyves, Imre; and Stamvik, Anders Robert, 3,963,707.

Fialkow, David: *See—*
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Fidelity-Research Inc.: *See—*
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Fillion, Pierre C.: *See—*
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Fink, Anton. Chuck seal. 3,963,249, Cl. 279-1.0ME.

Fiocca, Louis L.; Schmutzer, Joel J.; and Klusendorf, John I., to Advanced Instrument Development, Inc. System for controlling operation of the rotating anode of an X-ray tube. 3,963,930, Cl. 250-402.000.

Firdaus, Asad, to International Business Machines Corporation. Method and system for sensing an identifying means. 3,962,903, Cl. 73-37.500.

Fire Alarm Marketing Corporation: *See*—
Wells, Ronald H., 3,964,057.
Firestone Tire & Rubber Company, The: *See*—
Higbee, Wallace Carson; and Willey, Ronald Albert, 3,963,193.
Firey, Joseph Carl. Oil flow positive valve drive mechanism for gasoline engines. 3,963,006, Cl. 123-90.120.
Firmenich S.A.: *See*—
Buchi, George Hermann; Wuest, Hans; Ohloff, Gunther; and Strickler, Hugo, 3,963,783.
Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Herbicidal mixtures of S-halobenzyl-N,N-dialkylthiolcarbamates and 3-lower alkyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxides and salts thereof. 3,963,477, Cl. 71-91.000.
Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicide mixtures of 3-lower alkyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxides or salts thereof and 2-(methyl, chlorophenoxy)-N-methoxyacetamides. 3,963,474, Cl. 71-91.000.
Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicidal mixtures of 3-lower alkyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxides and 3,5-dibromo-4-hydroxybenzaldoxime-0-(nitrophenyl)ethers. 3,963,475, Cl. 71-91.000.
Fischer, Adolf, deceased (by Fischer, Caecilie Emma, legal representative), to BASF Aktiengesellschaft. 3-Lower alkyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxides or salts thereof and 9-hydroxy-fluorenecarboxylic acid-(9) as herbicidal mixtures. 3,963,476, Cl. 71-91.000.
Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicide mixtures employing O,S-dimethyltetrachlorothioterephthalate. 3,963,478, Cl. 71-91.000.
Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicide mixtures of 3-lower alkyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxides or salts thereof and 4-halobutynyl-N-halophenyl carbamates. 3,963,479, Cl. 71-91.000.
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Fisher, Richard, to Lawrence Peska Associates, Inc., a part interest. Fire ladder. 3,963,097, Cl. 182-76.000.
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Hennion, Jean Maurice, 3,963,895.
Flagg, Delbert; and Balodis, Miroslaw, to Signal Laboratories, Inc. Keyboard switch system. 3,964,062, Cl. 340-365.00L.
Flagg, Richard Edward, to Double E Company, Inc. Chuck. 3,963,250, Cl. 279-2.00R.
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Flatland, Lloyd P. Dental handpiece. 3,962,789, Cl. 32-27.000.
Fleetwood Systems, Inc.: *See*—
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O'Connell, Donald L., 3,962,825.
Florens, Raymond Leopold, to AGFA-GEVAERT N.V. Photographic multilayer direct-positive silver halide element. 3,963,494, Cl. 96-69.000.
Flowers, Dervin L.; and Rice, V. Louise, to Motorola, Inc. Semiconductor wafer corrosion protection solution. 3,963,500, Cl. 106-14.000.
FMC Corporation: *See*—
Goodley, George F., 3,963,191.
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Fouletier, Jacques: *See*—
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Fowler, Eliot Patrick, to United Kingdom Atomic Energy Authority. Shielded cables. 3,963,854, Cl. 174-36.000.
Fowler, Larry G., to Sugar Cane Growers Cooperative of Florida. Cane planter. 3,963,138, Cl. 214-519.000.
Fraim, Freeman W.; Murphy, Preston V.; and Woodard, Alan P., to Thermo Electron Corporation. Unidirectional condenser microphone. 3,963,881, Cl. 179-111.00E.
Frank, Jamie, to Flair Manufacturing Corporation. Thermostatic control valve for a one-pipe steam system. 3,963,177, Cl. 236-37.000.
Franks, Lewis E., to United States of America, Air Force. Hybrid sample data filter. 3,963,911, Cl. 235-156.000.
Fraser, Kenneth G.: *See*—
Stillwagon, George B., Jr., 3,962,889.
Frazee, William T., to Ford Motor Company. Synchronized manually controlled multiple speed ratio transmission. 3,962,930, Cl. 74-473.00R.
Freller, Helmut, to Siemens Aktiengesellschaft. Method for the preparation of thin layers of tungsten and molybdenum. 3,963,839, Cl. 427-251.000.
French Oil Mill Machinery Company, The: *See*—
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Frenkel, Jean-Mathieu; Pelchat, Jacques; and Weisz, Michel, to Commissariat a l'Energie Atomique. Zirconium alloys. 3,963,534, Cl. 148-133.000.
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Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,963,753.
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Fuji Photo Film Co., Ltd.: *See*—
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Kato, Kazunobu; and Sakaguchi, Shinji, 3,963,495.
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Fujii, Hirokazu. Baseball bat. 3,963,239, Cl. 273-72.00A.
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Ginnasi, Alessandro; and Passoni, Giovanni, to Snam Progetti S.p.A. Extractive distillation of a dimethyl carbonate feed with water. 3,963,586, Cl. 203-96.000.
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Golovko, Georgy Anatolievich; and Ignatov, Jury Yakovlevich. Method of purifying a neon-helium mixture. 3,963,462, Cl. 55-25.000.

Gonzalez, Boris, to Societe Anonyme Automobiles Citroen. Vertebral column for an anthropomorphous dummy. 3,962,801, Cl. 35-17.000.

Good, Thomas W.; and Dehner, Bernard J., to Tonka Corporation. Connection for miniature toy vehicle parts. 3,962,820, Cl. 46-221.000.

Goodley, George F., to FMC Corporation. Strap dispenser for automatic strapping machine. 3,963,191, Cl. 242-75.430.

Gopinath, Bhaskarpillai; and Kurshan, Robert Paul, to Bell Telephone Laboratories, Incorporated. Periodic sequence generators using ordinary arithmetic. 3,963,905, Cl. 235-152.000.

Gordon, Robert Louis, to International Paper Company. Process for forming and applying a hermetic, heat sealed closure. 3,962,844, Cl. 53-39.000.

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Gourley, Charles A., to Litton Systems, Inc. Electrical crimp removable socket contact. 3,963,302, Cl. 339-217.00S.

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Grisar, Johann Martin; and Wiech, Norbert Leonard, to Richardson-Merrell Inc. Substituted benzhydryl lactamimide derivatives. 3,963,701, Cl. 260-239.00B.

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Groff, James H., Sr. Paint spray shield. 3,962,989, Cl. 118-504.000.

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Hagstrom, Kenneth Lavern; and Munshi, Sushil Gajendrarai, to North Electric Company. Non-symmetric folded four-stage switching network. 3,963,872, Cl. 179-18.0GF.

Haldeman, Charles W.; and Covert, Eugene E., to Massachusetts Institute of Technology. Vacuum cleaning. 3,963,515, Cl. 134-21.000.

Hall, Charles M.; and Johnson, Herbert G., to Upjohn Company, The. Pyridine dioxamic acids and esters. 3,963,660, Cl. 260-295.00R.

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Hampton, Quentin L. Apparatus and process for producing an organic product from sewage sludge. 3,963,471, Cl. 71-12.000.

Hamu, Kaino Johannes. Gripping device. 3,962,805, Cl. 38-102.500.

Hand, John W., to Cameron Engineers, Incorporated. Process for gasifying carbonaceous matter. 3,963,426, Cl. 48-197.00R.

Haning, James O.; Kool, Bram; Moritz, Jules G.; and Mizrahi, Robert, to Microform Data Systems, Inc. Film strip handling apparatus and method. 3,963,336, Cl. 353-26.00A.

Hankins, Charles William. Envelope flap processing apparatus. 3,962,848, Cl. 53-266.00A.

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Hansen, Frode Johan, to Redpath Dorman Long (North Sea) Limited. Stabilization of maritime structures. 3,962,878, Cl. 61-46.500.

Hansford, Rowland C., to Union Oil Company of California. Conversion catalysts. 3,963,644, Cl. 252-455.00Z.

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Harlan, Alfred Ray, to Motorola, Inc. Force directed keyslide cam. 3,962,923, Cl. 74-10.330.

Harned, John L., to General Motors Corporation. Engine with fast warm up heat pipe mixture heating. 3,963,010, Cl. 123-122.0AC.

Harned, John L., to General Motors Corporation. Engine with vapor heat transfer capsule for intake mixture heating. 3,963,012, Cl. 123-122.0AC.

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Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,963,753.

Harron, Robert E., to Brodie, Inc. Roll handling. 3,963,257, Cl. 280-43.120.

Hart, Alexander W., to Anchor Hocking Corporation. Sideseal closure cap and sealed package. 3,963,142, Cl. 215-346.000.

Hart, Gary Allen, to International Business Machines Corporation. Servo information pattern for rotating head magnetic tape unit independent of amplitude. 3,964,094, Cl. 360-77.000.

Hartemann, Pierre, to Thomson-CSF. Device for the directive transmission of elastic surface waves and process for making the same. 3,963,997, Cl. 333-30.00R.

Hartley, Frederick J.; and Foster, Michael R., to General Motors Corporation. Two-bed catalytic converter. 3,963,448, Cl. 23-288.0FB.

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Hashimoto, Shigeru; Ninomiya, Eizi; and Kuroda, Junko, to Teijin Limited; and Sunstar Dentifrice Co., Ltd. Liquid or pasty dentifrice and process for its preparation. 3,963,832, Cl. 424-56.000.

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Haubner, Georg; Hofer, Walter; and Meier, Werner, to Robert Bosch G.m.b.H. Simplified automatic advance ignition system for an internal combustion engine. 3,963,015, Cl. 123-148.0CC.

Hauck, Frederic Peter; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Intermediates useful in the preparation of aryldecahydropyrrolo[3,4-f]quinolines. 3,9 ⁻3,724, Cl. 260-287.0CF.

Haug, Lester A. Process for treating decomposable organic waste materials. 3,963,470, Cl. 71-9.000.

Hauni-Werke Korber & Co., KG: *See—*
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Hinzmann, Alfred, 3,962,957.

Haupt, Walter H. Tethering device kit. 3,963,192, Cl. 242-86.50R.

Hauschulz, Bruno; von Barneveld, Heinrich; Jordan, Wilfried; Mertmann, Josef; Rasner, Gerhard; and Brenienek, Harri, to Phenolchemie GmbH. Method of removing phenol from waste water. 3,963,610, Cl. 210-21.000.

Hauxwell, Frank; and Murton, Henry Roy, to Imperial Chemical Industries Limited. Aqueous compositions for use in applying dyestuffs. 3,963,432, Cl. 8-93.000.

Hawkins, Ronald G.; and Russ, Charles R., to Aluminum Company of America. Boltless spacer clamp. 3,963,855, Cl. 174-40.00R.

Hawthorne, David Geoffrey: *See—*
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Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Catalytic reactor for exhaust gases. 3,963,447, Cl. 23-288.0FA.

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Hayden, Rodney, to TRW Inc. Noiseless automotive relay. 3,964,007, Cl. 335-187.000.

Hayes, George T., to Domtar Limited. Processing whole trees. 3,963,064, Cl. 144-309.0AC.

Hays, Kenneth Scott, to AMP Incorporated. Battery terminal connector. 3,963,303, Cl. 339-237.000.

Hazelett, Robert William; Wood, John Frederick Barry; and Carmichael, Robert J., to Hazelett Strip-Casting Corporation. Symmetrical synchronized belt-steering system and apparatus for twin-belt continuous metal casting machines. 3,963,068, Cl. 164-278.000.

Hazelett Strip-Casting Corporation: *See—*
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Health Technology Labs, Inc.: *See—*
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Hecht, Sidney M.; and Kozarich, John W., to Massachusetts Institute of Technology. Alkylations employing in situ generation of diazoalkane alkylation reagents. 3,963,698, Cl. 260-211.50R.

Hedegaard, Arne Marius; and Jensen, Hugo Sand, to Rothenborg Patent & Licens K/S. Thread cutter for sewing machines. 3,962,980, Cl. 112-252.000.

Hederich, Volker; Kroeck, Friedrich Wilhelm; Gehrke, Guenter; and Neeff, Rutger, to Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,963,763, Cl. 260-376.000.

Hedges, Melvin R., to Cam Industries, Inc. Auxiliary extension platform assembly support frame drive means for an aerial ladder assembly. 3,963,095, Cl. 182-2.000.

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Heinz, Peter H.: *See—*
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Heitmann, Uwe; and Lorenzen, Heinz-Christen, to Hauni-Werke Korber & Co., KG. Method and apparatus for testing cigarettes or the like. 3,962,906, Cl. 73-41.000.

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Hekimian, Norris C.; and Turner, James F., to Hekimian Laboratories, Inc. Linear AGC circuit with controlled duty cycle sampling means. 3,963,992, Cl. 330-127.000.

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Hellerbach, Joseph; Hoffmann, Henri; and Zanetti, Guido, to Hoffmann-La Roche Inc. 1-Polyhydroxy alkyl-1,4-benzodiazepin-2-ones. 3,963,777, Cl. 260-562.00N.

Helm, Edward J.; and Tucker, Linwood G., to Koppers Company, Inc. Method and apparatus for suppressing the deposition of carbonaceous material in a coke oven battery. 3,963,582, Cl. 201-2.000.

Hemstreet, Harold S., to Perkin-Elmer Corporation, The. Monolithic beam splitter mirror arrangement. 3,963,353, Cl. 356-168.000.

Henderson, Angus D.; Verhoff, Francis H.; and Periale, John M., to Telecommunications Industries, Inc. Clarifier. 3,963,624, Cl. 210-521.000.

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Henkes, John L., Jr., to General Electric Company. Mammography fixture. 3,963,933, Cl. 250-456.000.

Hennion, Jean Maurice, to Fives-Cail Babcock S.A. Device for effecting the guiding and oscillation movements of a welding head equipped with an electrode-carrier nozzle. 3,963,895, Cl. 219-125.00R.

Henson, Alec Frank; and Bret, Gerard Marcel Marius, to Lever Brothers Company. Preparation of yogurt and quark. 3,963,836, Cl. 426-40.000.

Herb, John R., to Pharmachem Corporation. Blood component storage bag and glycerolizing set therefor. 3,963,026, Cl. 128-272.000.

Herbert Kannegiesser Kommanditgesellschaft: *See—*
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Heritage, Robert, to Rotaflex (Great Britain) Limited. Electrical current supply installations. 3,963,294, Cl. 339-22.00R.

Herron, Christopher C.; and Williams, Clyde R., to International Business Machines Corporation. Intermittent cleaner for rotating magnetic head. 3,964,104, Cl. 360-128.000.

Hess, Martin, to Koppers Company, Inc. Coal gasification process. 3,963,457, Cl. 48-202.000.

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Higbee, Wallace Carson; and Willey, Ronald Albert, to Firestone Tire & Rubber Company, The. Face clutch vehicle sensitive inertial retractors. 3,963,193, Cl. 242-107.40A.
Hilfman, Lee, to Universal Oil Products Company. Combination process for the conversion of heavy distillates to LPG. 3,963,600, Cl. 208-59.000.
Hilfman, Lee, to Universal Oil Products Company. Hydrocracking of hydrocarbons with a catalyst comprising an alumina-silica support, a group VIII metallic component, a group VI-B metallic component and a fluoride. 3,963,601, Cl. 208-111.000.
Hill, David C., to Haskel Engineering & Supply Co. Air driven pump. 3,963,383, Cl. 417-401.000.
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Hino, Tetsuo; and Hashiguchi, Susumu. Magnetic recording disc. 3,964,101, Cl. 360-99.000.
Hinzmann, Alfred, to Hauni-Werke Korber & Co., KG. Curling device for webs of paper or the like. 3,962,957, Cl. 93-1.00R.
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Hitachi Chemical Company, Ltd.: *See—*
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Hoffman, Gary R.; and Rinkers, William P., to Bendix Corporation, The. Power amplifier using a plurality of parallel connected amplifier elements and having burn-out protection. 3,963,993, Cl. 330-124.00R.
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Hogberg, Knut Bertil; Fex, Hans Jacob; Konyves, Imre; and Stamvik, Anders Robert, to Aktiebolaget Leo. Novel N-nitroso compounds, compositions containing such compounds, processes for their preparation and methods of treatment therewith, and novel intermediates. 3,963,707, Cl. 260-239.55D.
Hogg, Walter R., to Coulter Electronics, Inc. Semi-automatic adjusting delay for an electronic particle separator. 3,963,606, Cl. 209-3.000.
Hogg, Walter R., to Coulter Electronics, Inc. Pulse amplitude discriminating circuit. 3,963,983, Cl. 324-71.0CP.
Hohmann, Walter, to Bayer Aktiengesellschaft. Process for producing 1,5-dinitroanthraquinone and 1,8-dinitroanthraquinone. 3,963,762, Cl. 260-369.000.
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Holzwarth, Henry A.; and Wark, John D., to Keyes Fibre Company. Windowed mid-lock carton with positive closure latch. 3,963,172, Cl. 229-44.0EC.
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Howell, Edward Keith, to General Electric Company. Ground fault circuit interrupting device and differential current sensor therefor. 3,963,959, Cl. 317-9.00R.

Hubbell, Henry, to Textron, Inc. Method and apparatus for making an eccentric locking collar. 3,962,899, Cl. 72-334.000.

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Hyland, Francis P.; Tollefson, Phillip J.; Pilon, Harlan J.; and Borchert, Hugo E., to Hy Grip Products Co. Storage magazine and sheet feeder for typing apparatus. 3,963,110, Cl. 197-130.000.

Hyler, John H., to Westinghouse Air Brake Company. Scraper having forwardly swingable apron and full width pivoted striker. 3,962,804, Cl. 37-126.0AA.

Hynes, William M. Compressed gas drying apparatus. 3,963,466, Cl. 55-269.000.

Ichihashi, Osamu; and Muramatsu, Sadao, to Yashica Co., Ltd. Shutter speed display devices for electric shutter operating circuits. 3,964,076, Cl. 354-51.000.

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Inoue, Mutsuhiro; Konno, Akira; and Izaka, Yukio, to Canon Kabushiki Kaisha. Information searching device. 3,963,937, Cl. 250-548.000.

Institute za Metalloobrabotvashti Machini: *See—*
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Kilian, Alois, to Dravo Corporation. Process for measuring, controlling and optimizing gas flow through a sinter mixture on travelling grates. 3,962,904, Cl. 73-38.000.
Kima, Keisuke; and Sugitani, Yasuo, to Sumitomo Metal Industries, Ltd. Automatic roll position measuring apparatus for continuous casting machine. 3,962,794, Cl. 33-182.000.
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Knauer, Wolfgang: *See*—
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Stumpf, Willy; Queiser, Horst; Juntgen, Harald; Schroter, Hansjurgen; and Knoblauch, Karl, 3,963,460.
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Kobayashi Perfumery Co., Ltd.: *See*—
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Kober, Harald, to G. Siempelkamp & Co. Press for perforating and trimming boards of filamentary material. 3,962,941, Cl. 83-228.000.
Kobori, Toshio; Tsujimoto, Kayoshi; Nanba, Yasuhiro; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Exposure control devices for photographic cameras. 3,964,073, Cl. 354-29.000.
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Anderka, Gerold, 3,963,359.
Kohnen, Keith, to Air Products and Chemicals, Inc. Double foot valve for cryogenic fluid containing tanks. 3,963,381, Cl. 417-360.000.
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Murayama, Yoichi; Matsumoto, Masayuki; and Kashiwagi, Kunihiro, 3,962,988.
Kojima, Hiroshi: *See*—
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Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, to Ciba-Geigy AG. Method of dyeing with dispersible azo anilino dyestuffs. 3,963,431, Cl. 8-41.00C.
Kolster, Harvey L.: *See*—
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Kondis, Thomas J., to Aluminum Company of America. Large size aluminum particle containing aluminum oxide therein. 3,963,482, Cl. 75-0.50R.
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Konno, Akira: *See*—
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Mathesius, Walther H.; and Macdonald, Somerled, 3,963,483.
Powers, Robert E., 3,963,481.
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Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, to Nissan Motor Co., Ltd. System for reforming engine fuel into hydrogen gas-containing mixture by catalytic reaction. 3,963,000, Cl. 123-3.000.
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Koss, George A.; and Gurta, Daniel J., to Ford Motor Company. Laminating interlayer expanding apparatus. 3,962,760, Cl. 26-72.000.
Kosti, Carl M. X-ray film with hydrophillic layer containing developing and fixing agents. 3,963,497, Cl. 96-76.00R.
Kotlar, Edward A. Stamped sheet metal pulley. 3,962,926, Cl. 74-230.800.
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Krenzer, John, to Velsicol Chemical Corporation. Thiadiazolylimidazolidinone herbicides. 3,963,473, Cl. 71-90.000.
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Krikorian, Oscar H., to United States of America, Energy Research and Development Administration. Method for producing uranium atomic beam source. 3,963,921, Cl. 250-251.000.

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Krol, Helmut: *See—*
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Kruckenberg, Perry Lester; Anderson, Harld Elden; and Carlson, Ray Lavette, to McCulloch Corporation. Combustion system for internal combustion engines. 3,963,001, Cl. 123-32.00D.

Krueger, Arnold E.: *See—*
Neitzel, Joseph C.; Tomlinson, Ronald A.; Hurst, Allen R., Jr.; Bodovsky, Paul W.; and Krueger, Arnold E., 3,962,846.

Krulwich, Lester S. Glass cutting apparatus. 3,963,159, Cl. 225-96.500.

Kruse, Walter M.; and Wright, Leon W. Polyhydric alcohol production using ruthenium zeolite catalyst. 3,963,788, Cl. 260-635.00C.

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Kubicek, Donald H., to Phillips Petroleum Company. Mercaptans by addition of hydrogen sulfide to olefins in presence of carbon disulfide. 3,963,785, Cl. 260-609.00B.

Kuhlmann, Hans-Jochen, to Kuhlmann & Rust KG, Maschinenfabrik. System for the remote control of the jack cylinders of a hydraulically operated crane. 3,963,051, Cl. 137-637.000.

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Kuhn, Rolf; Hardebeck, Klaus; Heinemann, Helmut; and Osmers, Knut, to Boehringer Mannheim G.m.b.H. Pharmaceutical compositions for the treatment of hydropic conditions. 3,963,834, Cl. 424-240.000.

Kulina, Mark R.: *See—*
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Kulka, Thomas S. Telephone enclosure with sound prevention means. 3,963,883, Cl. 179-179.000.

Kulkarni, Avinash D., to Westinghouse Electric Corporation. Molybdenum recovery from spent acid solution. 3,963,823, Cl. 423-56.000.

Kunde, Joachim: *See—*
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Kunkle, Ned T., to Westinghouse Electric Corporation. Surge arrester construction. 3,963,965, Cl. 317-61.000.

Kuramoto, Naoya; Saito, Hachiro; and Yamamoto, Wataru, to Teijin Limited. Foam-containing slurry to make porous, inorganic construction material. 3,963,507, Cl. 106-86.000.

Kuratsuji, Takatoshi: *See—*
Shimotsuma, Sakae; Hosoi, Masahiro; Kuratsuji, Takatoshi; Kawase, Shoji; and Shima, Takeo, 3,963,844.

Kurei, Hiroshi; and Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electro-mechanical arrangement in a single lens reflex camera having a detachable bottom cover plate for providing access to a circuit board of the arrangement. 3,964,078, Cl. 354-152.000.

Kurihara, Haruki: *See—*
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Kuroda, Junko: *See—*
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Kurshan, Robert Paul: *See—*
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Kushida, Hachiro; Takasugi, Tsuneji; Ikeda, Shinji; and Shiono, Takashi, to Citizen Watch Co., Ltd. Process for the manufacture of a decorative aluminum product. 3,963,589, Cl. 204-29.000.

Kwiatkowski, Gerald M.: *See—*
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,962,845.

Kyomori, Hiroyuki; Sasaki, Kazuhiro; and Takahashi, Mitsuhiro, to Kobayashi Perfumery Co., Ltd. Method of preparing 2-hydroxy-3-alkyl-2-cyclopenten-1-one. 3,963,781, Cl. 260-586.00R.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
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La Telemecanique Electrique: *See—*
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La Bate, Ernest Edward: *See—*
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Labus, Herwig, to Kernforschungsanlage Juelich Gesellschaft mit beschraenkfer Haftung. Bearing arrangement for rotary piston engine for compressing and expanding gases. 3,963,390, Cl. 418-188.000.

Lacan, Guy, to La Telemecanique Electrique. Electrical apparatus. 3,964,006, Cl. 335-132.000.

Lacina, William B.: *See—*
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La Clair, Louis Maynard; McWhirter, John Ruben; and Ross, William Lawrence, to Union Carbide Corporation. Integral circular wastewater treatment process. 3,963,609, Cl. 210-7.000.

Lainez, Lucien: *See—*
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Lamphere, David A., to Simmonds Precision Products, Inc. Fuel tank alarm systems. 3,964,037, Cl. 340-244.00R.

Landsman, Emanuel; and Landsman, Irving. Childproof cap for aerosol dispenser. 3,963,152, Cl. 222-402.130.

Landsman, Irving: *See—*
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Lapointe, Joseph A.; and Sheel, Ronald S., to Domtar Limited. Air bearing moisture profiler. 3,962,799, Cl. 34-54.000.

LaPointe, Joseph A., to Domtar Limited. Chip crusher. 3,962,966, Cl. 100-156.000.

Latter, Geoffrey, to A. C. Hamilton & Co. Injection moulding machine. 3,963,401, Cl. 425-242.00R.

Lautin, Leon. Handle and means for securing same to a piece of luggage. 3,963,104, Cl. 190-58.00R.

Laval, Claude C., Jr. Purging apparatus. 3,963,073, Cl. 166-105.100.

Lawrence Peska Associates, Inc.: *See—*
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Eugene, Emmanuel, 3,964,002.
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Lea-Ronal, Inc.: *See—*
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Lebduska, Robert L., to United States of America, Navy. Focusing coupling device for multi optical-fiber cable. 3,963,308, Cl. 350-96.00C.

Lebizay, Gerald: *See—*
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LeBlanc, Destin A.; and LeBlanc, Robert Bruce, to Cotton Incorporated. Flame retardant process for cellulosic material including cyanamide, phosphonic acid, antimony oxide and polymeric halogen-containing material. 3,963,437, Cl. 8-192.000.

LeBlanc, Robert Bruce: *See—*
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Lech, Richard J., to International Harvester Company. Variable volume dual pump circuit. 3,962,870, Cl. 60-428.000.

Lecocq, Alfred, to Commissariat a l'Energie Atomique. Method for preventing tritium contamination of secondary salt and steam in a molten salt reactor. 3,963,564, Cl. 176-37.000.

Le Craw, Roy Conway: *See—*
Blank, Stuart Lawrence; and Le Craw, Roy Conway, 3,964,035.

Lee, Joseph L. Hand gun hammer block. 3,962,809, Cl. 42-66.000.

Leenhouts, Albert C.; Senak, Peter, Jr.; and Emery, Arthur, to Superior Electric Company, The. Velocity change circuit for a digital motor. 3,963,971, Cl. 318-696.000.

Leesona Corporation: *See—*
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Legris, Andre, to Societe Legris France S.A. Fluid connector. 3,963,267, Cl. 285-93.000.

Lehmann, Hartmut: *See—*
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Leiblich, Gordon Francis. Fence dropper and method of production. 3,962,900, Cl. 72-379.000.

Leifeld & Co.: *See—*
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Lelievre, Andre Y. C.: *See—*
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Lemelson, Jerome H. Tool control system and method. 3,963,364, Cl. 408-8.000.

Lentz, Jacob D., Jr.: *See—*
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Lenz, Arnold; and Rogler, Walter, to Dynamit Nobel Aktiengesellschaft. Process for the manufacture of alkali metal hydrides in coarse powder form. 3,963,831, Cl. 423-646.000.

Leonard, Charles Arthur: *See—*
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L'Eplattenier, Francois; Vuitel, Laurent; and Pugin, Andre, to Ciba-Geigy Corporation. Bis-azomethine metal complex colorants from hydroxycoumarin derivatives or hydroxychromone derivatives. 3,963,708, Cl. 260-240.00G.

Lepselter, Martin Paul: *See—*
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Lerner Manufacturing, Inc.: *See—*
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Leroux, Jean E., to Poclain. Machine having a dual function jib. 3,963,134, Cl. 214-145.00R.

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Letchford, Brian Robert: *See—*
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Levasseur, Joseph L., to H. R. Electronics Company. Coin controlled circuits for vending and other coin controlled devices. 3,963,035, Cl. 133-2.000.

Lever Brothers Company: *See—*
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Levin, Evgeny Sergeevich; Permyakov, Vladimir Andreevich; Zozulya, Nikolai Vasilievich; Shkuratov, Igor Yakovlevich; Kalinin, Boris Leonidovich; Vakulenko, Boris Fedorovich; and Podgorochny, Pavel Ivanovich. Chell-and-tube heat exchanger for heating viscous fluids. 3,963,071, Cl. 165-142.000.

Levine, Morris M.; and Cake, Arthur F., to Uranus Electronics Inc. Electronic watch. 3,962,858, Cl. 58-4.00A.

Lewis, Arthur M.; and Winkler, Charles L., to Westinghouse Electric Corporation. Position measurement apparatus. 3,963,098, Cl. 187-29.00R.

Lewis, Raymond M., to Control Data Corporation. Boron or graphite reinforced voice coil and manufacturing process. 3,963,882, Cl. 179-115.5VC.

Lewis, Wade H. Strap wrench. 3,962,936, Cl. 81-64.000.

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Ligenza, Joseph Raymond: *See—*
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Lindemann, Karl H., to Lindemann & Co. GmbH. Chromatizing process and composition. 3,963,527, Cl. 148-6.200.

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Lindner, Helmut: *See—*
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Lindsay, La Vern G., to Union Camp Corporation. Cushion partition tray for insertion into a box. 3,963,171, Cl. 229-42.000.

Lindstrom, Olle, to Hooker Chemicals & Plastics Corporation. Method for the electrolytic production of alkali. 3,963,592, Cl. 204-98.000.

Lineberg, Birger David, to AB Volvo. Method for controlling quenching. 3,963,535, Cl. 148-144.000.

Lines, Roy. Stone and rod holder device. 3,962,771, Cl. 29-283.000.

Ling, Leo M.: *See—*
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Lips, Donald C., to Garrett Corporation, The. Compensated pressure transducer. 3,962,921, Cl. 73-398.00C.

Liss, John F. Outlet boxholder. 3,963,204, Cl. 248-27.00R.

Littelfuse, Inc.: *See—*
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Little, Philip Andrew. Building unit. 3,962,835, Cl. 52-73.000.

Litton Systems, Inc.: *See—*
Gourley, Charles A., 3,963,302.

Liu, Ming-Jen. Closure cap with self-opening means. 3,963,141, Cl. 215-254.000.

Lock, Emil P.: *See—*
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Lockhead Missiles & Space Company, Inc.: *See—*
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Lodding Engineering Corporation: *See—*
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Loft, Bryan Clarence: *See—*
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L'Oreal: *See—*
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O'Brien, Charles F., to National Car Rental System, Inc. Dredging head. 3,962,803, Cl. 37-66.000.

O'Brien, Richard C., to O.K. Partnership. Combined article selector and coder. 3,963,176, Cl. 234-48.000.

O'Connell, Donald L., to Floral Innovations, Inc. Holder for supporting flower arrangements. 3,962,825, Cl. 47-41.120.

O'Connor, Thomas J. Machining structure. 3,962,830, Cl. 51-58.000.

Oeleq Limited: *See—*
Blackwood, Wilfred Norman; Gallagher, Finbar Joseph; Richey, Kenneth Rutherford; and Marshall, William, 3,963,904.

Ogawa, Katsumasa: *See—*
Sawaguchi, Yoji; and Ogawa, Katsumasa, 3,963,900.

Ogden, Dennis Henry, to British Industrial Plastics Limited. Process for making improved urea/formaldehyde foams. 3,963,650, Cl. 260-2.50F.

Ogiso, Mithutoshi: *See—*
Ohtaki, Syohei; Ogiso, Mithutoshi; Kiyohara, Takehiko; and Mitani, Taizo, 3,964,075.

Oguchi, Toshihiko: *See—*
Takagi, Michiyasu; and Oguchi, Toshihiko, 3,962,992.

Ohchi, Shuzo. Kneading machine. 3,963,220, Cl. 259-107.000.

Ohi, Tadao. Wrinkle-proof mechanism for paper roll supply. 3,963,187, Cl. 242-55.000.

Ohloff, Gunther: *See—*
Buchi, George Hermann; Wuest, Hans; Ohloff, Gunther; and Strickler, Hugo, 3,963,783.

Ohno, Hidemaru; and Hayashi, Yutaka, to Tokyo Shibaura Electric Co., Ltd. X-ray tomography apparatus. 3,963,932, Cl. 250-445.00T.

Ohno, Masaji; and Kataoka, Mutsuo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Derivatives of 6-methyl-2H-pyran-2,4(3H)-dione. 3,963,756, Cl. 260-343.500.

Ohno, Tomeji: *See—*
Yonezawa, Masatomo; Ohno, Tomeji; Iwase, Keizo; Takada, Toshio; Kiyama, Masao; and Akita, Toshikazu, 3,963,630.

Ohtaki, Syohei; Ogiso, Mithutoshi; Kiyohara, Takehiko; and Mitani, Taizo, to Canon Kabushiki Kaisha. Photographing apparatus. 3,964,075, Cl. 354-51.000.

Oishi, Kazuo: *See—*
Yamada, Takashi; Oishi, Kazuo; Kato, Toshiaki; and Iwase, Kazuo, 3,964,016.

Oka, Koichiro: *See—*
Takeda, Hiromu; Kobayashi, Takuichi; Oka, Koichiro; and Tanaka, Kazumi, 3,963,821.

Okamoto, Yoshinori; and Onda, Takamasa, to Honda Giken Kogyo Kabushiki Kaisha. Reaction moment balancing device for an engine. 3,962,932, Cl. 74-604.000.

Okazaki Tasuku. Simple, small-sized fuse. 3,964,010, Cl. 337-148.000.

O'Keefe, Donald R.; and Gasper, A. Joseph, to Minnesota Mining and Manufacturing Company. One-part, room-temperature latent, curable isocyanate compositions. 3,963,680, Cl. 260-77.5NC.

Oki Electric Industry Company, Ltd.: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, 3,962,969.

O'Kon, James; and Magness, William, to Shoreline Precast Company. Barge factory. 3,962,981, Cl. 114-.50F.

Okonogi, Nobuo: *See—*
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Okubo, Ichiro: *See—*
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Oldewurtel, Edward Joseph: *See—*
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Olin Corporation: *See—*
Danna, Peter A, 3,963,595.
Kircher, Morton S., 3,963,596.
Prange, Neil, 3,963,543.
Staba, Edward Anthony, 3,963,544.

Olschewski, Armin: *See—*
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Ernst, Horst Manfred; Brandenstein, Manfred; and Olschewski, Armin, 3,963,106.

Olson, George E., to A. O. Smith Harvestore Products, Inc. Bidirectional ratchet drive mechanism. 3,962,925, Cl. 74-143.000.

Olympus Optical Co., Ltd.: *See—*
Sato, Masaaki, 3,964,099.

Omark Industries, Inc.: *See—*
Silvon, Kay, 3,962,929.

Omni Corporation: *See—*
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Onda, Takamasa: *See—*
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Ono, Akihiro: *See—*
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Ono, Hiromu, to Aoki Construction Company Limited. Connecting structure for ocean-going push-barge. 3,962,983, Cl. 114-235.00R.

Oosterhouse, Gerard J., to Rowe International Inc. Solid state search unit for automatic phonograph. 3,964,025, Cl. 340-162.000.

Ordorica, Miguel A.: *See—*
Alley, Raymond L.; and Ordorica, Miguel A., 3,963,070.

Ormrod, John H., to Atomic Energy of Canada Limited. Tritium target for neutron source. 3,963,934, Cl. 250-499.000.

Orui, Ryuzo; Goto, Genichi; and Yamaguchi, Toshio, to Nippon Electric Company Ltd. Heat-dissipating device for the collector of traveling-wave tube. 3,963,952, Cl. 313-45.000.

Osaka Soda Co., Ltd.: *See—*
Suzui, Akio; Nose, Shinji; Kodama, Takashi; Yokoyama, Kenji; Matsumoto, Kazuya; and Fujio, Yoshiharu, 3,963,661.

Osawa, Kisuke: *See—*
Tsujimoto, Michihiro; Osawa, Kisuke; and Okubo, Ichiro, 3,963,429.

Osborn, Glen E. Hay cubing assembly. 3,963,405, Cl. 425-331.000.

Osgood, Edmond R.: *See—*
Hlynsky, Alex; Griggs, Jan M.; and Osgood, Edmond R., 3,963,751.

Oshida, Yoshiki, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for bonding bodies made of metallic material. 3,963,163, Cl. 228-196.000.

Oshida, Yoshiki, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for bonding bodies made of metallic materials. 3,963,164, Cl. 228-217.000.

Osmers, Knut: *See—*
Kuhn, Rolf; Hardebeck, Klaus; Heinemann, Helmut; and Osmers, Knut, 3,963,834.

Osswald, Gunter; and Reus, Josef, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of toned carbon black. 3,963,510, Cl. 106-289.000.

Ostarch, William F., to Van Der Horst Corporation of America. Method of producing a pitted, porous electrodeposited chromium coating. 3,962,834, Cl. 51-323.000.

Ostrow, Barnet D.: *See*—
Nobel, Fred I.; and Ostrow, Barnet D., 3,963,455.

Ouchi, Hiromu; Nishida, Masamitsu; and Numata, Kazunori, to Matsushita Electric Industrial Co., Ltd. Method of preparing ferroelectric ceramics. 3,963,631, Cl. 252-62.900.

Outboard Marine Corporation: *See*—
Borst, Gaylord M.; and Meyer, Martin H., 3,962,955.
Miller, George E., 3,963,389.

Ovation Instruments, Inc.: *See*—
Rickard, James H., 3,962,946.

Owens-Corning Fiberglas Corporation: *See*—
Dunn, John W., 3,962,753.

Owens-Illinois, Inc.: *See*—
Fein, Michael E.; Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., 3,963,633.
Stengle, Edward J., Jr., 3,962,939.

Oxy-Catalyst, Incorporated: *See*—
Stahl, John F., 3,963,062.

Ozawa, Kyoichi, to Hitachi, Ltd. Apparatus for removing unnecessary components from samples. 3,963,614, Cl. 210-198.00C.

Ozawa, Shuji; Aoki, Akihiro; and Fujie, Hiroshi, to Teijin Limited. Method of preparing aromatic polyamide solutions. 3,963,664, Cl. 260-30.200.

P. R. Mallory & Co., Inc.: *See*—
Borbely, Alexander S.; and Bereman, Jon A., 3,963,502.

Palermo, Frank P.: *See*—
Belady, Laszlo A.; and Palermo, Frank P., 3,964,028.

Palmenberg, Edward C.: *See*—
Wachtell, Richard L.; and Palmenberg, Edward C., 3,963,894.

Palmer, John P., to General Dynamics Corporation. Photodetector array and method of manufacturing same. 3,962,778, Cl. 29-572.000.

Palmer, John P., to General Dynamics Corporation. Integrated optical-to-electrical signal transducing system and apparatus. 3,963,920, Cl. 250-239.000.

Pandjiris Weldment Co., The: *See*—
Cooper, Cleveland N., 3,963,231.

Panek, George J.; and Selvin, Gerald J., to International Telephone and Telegraph Corporation. Underwater pressure compensated electrical connector. 3,963,297, Cl. 339-94.00M.

Pantel, Howard W., Jr.: *See*—
Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 3,962,845.

Pantone, Anton M., to CHI Systems, Inc. X-ray film coded identification system. 3,962,807, Cl. 40-78.150.

Park, Chang-Man: *See*—
Wood, George R.; and Park, Chang-Man, 3,963,795.

Park, Kisoon, to Union Carbide Corporation. Fiber lubricant composition. 3,963,628, Cl. 252-8.800.

Parke, Davis & Company: *See*—
Elslager, Edward Faith, 3,963,740.

Parry, Edward, to Thermal Conduction Engineering Corporation. All weather safety shower. 3,962,733, Cl. 4-145.000.

Parsons Controls Limited: *See*—
Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, 3,962,755.
Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, 3,962,810.
Buschini, Anthony Alan; and Swarsbrick, Douglas Edward, 3,962,811.

Parsons, Gary L.; and Turner, James Keith, to Gaston County Dyeing Machine Company. Sealing arrangement for hyperfiltration. 3,963,616, Cl. 210-232.000.

Pascarella, Robert S. Viscous liquid transfer device. 3,963,063, Cl. 141-309.000.

Pascoe, Frank T., to Westinghouse Air Brake Company. Automatic control system for railroad interlocking. 3,963,203, Cl. 246-134.000.

Pasqualucci, Carmine: *See*—
Marsili, Leonardo; and Pasqualucci, Carmine, 3,963,705.

Pasquon, Italo: *See*—
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Passoni, Giovanni: *See*—
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Patelli, Bianca: *See*—
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Pater, Walter E.; and Rowley, James R., to PPG Industries, Inc. Front restraint device for shipping bins. 3,963,122, Cl. 206-448.000.

Patrignani, Jerry M., to Lawrence Peska Associates, Inc., a part interest. Bowling ball and gripping device. 3,963,238, Cl. 273-63.00A.

Patterson, Harold A.; and Danylik, Victor, to United States of America, Army. Mortar cavity lining. 3,963,556, Cl. 156-423.000.

Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Article transferring apparatus. 3,963,557, Cl. 156-519.000.

Patton, George Allen; and Tucci, John James, to AMP Incorporated. Multi-conductor tap-connector. 3,963,300, Cl. 339-156.00R.

Patton, Noel Thomas. Portable air circulating fan. 3,963,382, Cl. 417-361.000.

Pattyn, Herman Alberik: *See*—
Vanassche, Willy Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 3,963,493.

Paulsen, Earl W., to Ling, Leo M., a part interest. Resharpenable recutter screen for forage harvester. 3,963,183, Cl. 241-88.400.

Pavlinik, Claudia S., to Lawrence Peska Associates, Inc. Head turban. 3,962,728, Cl. 2-174.000.

Pelchat, Jacques: *See*—
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Pennsylvania Engineering Corporation: *See*—
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Pennwalt Corporation: *See*—
D'Angelo, Antonio Joseph; Mageli, Orville Leonard; and Sheppard, Chester Stephen, 3,963,673.

Penny, Samuel Lee, to Dresser Industries, Inc. Cantilevered roller separator for rock bit bearings. 3,963,282, Cl. 308-8.200.

Pepe, Enrico James; and Kanner, Bernard, to Union Carbide Corporation. Quaternary ammonium salts of chloromethylated silicon compounds. 3,963,726, Cl. 260-290.00S.

Percarpio, Edward P.: *See*—
Shichman, Daniel; and Percarpio, Edward P., 3,963,394.

Perfect, Alan J., to Johnson & Johnson. Container for dental materials and the like. 3,963,120, Cl. 206-219.000.

Perfection Manufacturing Company, The: *See*—
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Periale, John M.: *See*—
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Permyakov, Vladimir Andreevich: *See*—
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Perrier, Dorothy M.: *See*—
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Perrin, Frederick W. Gun rest cradle. 3,963,156, Cl. 224-1.00R.

Peter Ilmberger KG, Maschinen-u. Zahnradfabrik: *See*—
Brandl, Josef, 3,962,987.

Peters, Leo. Apparatus for roasting meat. 3,962,961, Cl. 99-426.000.

Petersen, Harro: *See*—
Wurmb, Rolf; Schmidt, Franz; and Petersen, Harro, 3,963,668.

Petersen, Mogens; and Gude, Klaus Erik. Spray drying device for the production of powder, e.g. milk powder. 3,963,559, Cl. 159-4.00S.

Petersen, Paul S.: *See*—
Jerney, Thomas D.; and Petersen, Paul S., 3,963,161.

Petersen, Robert E.; and Chesebro, Roger F., to Westinghouse Electric Corporation. Support assembly for electric heating unit. 3,963,859, Cl. 174-148.000.

Petrucciani, Ahlene M., to Lawrence Peska Associates, Inc., a part interest. Dog kennel module. 3,962,994, Cl. 119-19.000.

Peyrouset, Andre; and Prechner, Roland, to Ato Chimie. Viscometer. 3,962,907, Cl. 73-55.000.

Pfeffer, Philip E.; and Silbert, Leonard S., to United States of America, Agriculture. Process for the preparation of aldehydes. 3,963,784, Cl. 260-601.00R.

Pfeiffer, Francis R.: *See*—
Cooper, David J.; and Pfeiffer, Francis R., 3,963,695.

Pfirrmann, Rolf Wilhelm, to Ed. Geistlich Sohne A.G. fur Chemische Industrie. Sulphamoylphenyl-imidazolidinones. 3,963,706, Cl. 260-239.900.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Disubstituted xanthone carboxylic acid compounds. 3,963,752, Cl. 260-335.000.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Disubstituted xanthone carboxylic acid compounds. 3,963,753, Cl. 260-335.000.

Pfotenhauer, James M. Manually cocking spring-powered projectile launcher. 3,963,017, Cl. 124-21.000.

Pharmachem Corporation: *See*—
Herb, John R., 3,963,026.

Phenolchemie GmbH: *See*—
Hauschulz, Bruno; von Barneveld, Heinrich; Jordan, Wilfried; Mertmann, Josef; Rasner, Gerhard; and Brenienek, Harri, 3,963,610.

Philip, Thomas, to University Patents, Inc. Recovery of anthocyanin from plant sources. 3,963,700, Cl. 260-236.500.

Phillips, Adrian, to Aeroceanics Fishways Corporation. Fishway. 3,962,876, Cl. 61-21.000.

Phillips Petroleum Company: *See*—
Bost, Howard W., 3,963,571.
Doss, Richard C.; and Jones, Faber B., 3,963,850.
Kubicek, Donald H., 3,963,785.
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Phipps, John Alastair; and Legg, Morris James, to Plastic Coatings Limited. Apparatus for coating elongate articles. 3,962,990, Cl. 118-620.000.

Physics International Company: *See*—
Godfrey, Charles S.; and Watson, John D., 3,963,275.

Pickering, Charles E., to Eastman Kodak Company. Anti-bounce shutter. 3,964,081, Cl. 354-246.000.
Pierini, John M.; and Brown, Leon E. Intervalometer apparatus. 3,963,968, Cl. 317-141.00S.
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Pignocco, Arthur J.: *See—*
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Pinhas, Henri; and Susini, Monique, to Serdex - Societe d'Etudes, de Recherches, de Diffusion et d'Exploitation. 2-(Benzofuroyl)phenyl acetic acids. 3,963,758, Cl. 260-346.20R.
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Pippin, Reginald F., Jr. Reaction toy arrangement and method. 3,962,818, Cl. 46-74.00D.
Piroska, Jozsef, to Rummelhoff, Eric. Bolt pretensioning device. 3,962,950, Cl. 85-32.00R.
Pirro, Dominick Anthony; and Kennedy, Paul Levere, to Veeder Industries, Inc. Resettable counting mechanism. 3,963,903, Cl. 235-144.00R.
Placek, Eugene W., to International Magna Corporation. Method and apparatus for removing solid tires from rims. 3,963,417, Cl. 432-225.000.
Plakas, Chris J. Multifiltration unit. 3,963,615, Cl. 210-203.000.
Plastic Coatings Limited: *See—*
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Playfoot, Kerwin C.; and Todt, William H., to Westinghouse Electric Corporation. Temperature compensated inductive liquid metal level detection system. 3,962,919, Cl. 73-290.00R.
Pockrandt, Gunter, to Metallgesellschaft Aktiengesellschaft. Process for interrupting normal operation of a hydrocarbon gasification reactor. 3,963,641, Cl. 252-373.000.
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Polaroid Corporation: *See—*
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Pollock, Donald M.; and Hallowell, Fulton W., to Consupak, Inc. Method and apparatus for multiple blow molding with rotary turntable. 3,963,404, Cl. 425-326.00B.
Pollock, Robert William, to McGraw-Edison Company. Miniature multipole double-throw slide switch. 3,963,884, Cl. 200-16.00D.
Pommerening, Uwe A.; and Richards, Glenn L., to Stromberg-Carlson Corporation. Local transfer arrangement for electronic private automatic branch exchange. 3,963,873, Cl. 179-18.0BD.
Pommerening, Uwe A.; and Richards, Glenn L., to Stromberg-Carlson Corporation. Busy-test arrangement for electronic private automatic branch exchange. 3,963,874, Cl. 179-18.0AB.
Pompidor, Guy; and Serriere, Jean-Luc, to Pont-A-Mousson S.A. Process for assembling tubes of plastics material and assemblies resulting from said process. 3,962,766, Cl. 29-157.30B.
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Pope, John W. Electronic smoking inhibiting device. 3,963,033, Cl. 131-170.00A.
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Proni, Oscar; Melnick, Loran Vinson; and Henderson, William Taylor, to Coulter Electronics, Inc. Apparatus for drawing, measuring and discharging proportional amounts of fluid. 3,963,148, Cl. 222-132.000.
Protta, Jean-Claude; and Savary, Antoine, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Apparatus for determining and lastingly showing the time at which an event occurs. 3,962,861, Cl. 58-39.500.
Pruitt, Malcolm E.; and Lovett, Joe B., to Dow Chemical Company, The. Polymerization of ethylene in stirred autoclave with cooled inner wall. 3,963,690, Cl. 526-65.000.
Pugin, Andre: *See—*
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Quandt, Robert S. Ocular testing method and apparatus. 3,963,019, Cl. 128-2.00T.
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Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Cornell; and Van Laerhoven, Willy Joannes, 3,963,718.
Ragan, Randall C., to North American Philips Corporation. Single turn variable resistance device having a split shaft rotor. 3,964,011, Cl. 338-166.000.
Ramberg, William I., to GTE Sylvania Incorporated. Metal halide discharge lamp having a reflective coating. 3,963,951, Cl. 313-44.000.
Randmere, Uno; and Suntop, Morris A., to Stromberg-Carlson Corporation. Loudspeaking telephone hysteresis and ambient noise control. 3,963,868, Cl. 179-1.0HF.
Rank Xerox Ltd.: *See—*
de Keyzer, Cornelius J., 3,963,343.
Tamai, Yasuo; Miyatuka, Hajime; and Honjo, Satoru, 3,963,486.
Raseman, Chad J.: *See—*
Manowitz, Bernard; Steinberg, Meyer; Sheehan, Thomas V.; Winsche, Warren E.; and Raseman, Chad J., 3,963,598.
Rasmussen, Max Otto Henri. Method and apparatus for producing continuous surface elements. 3,963,549, Cl. 156-193.000.
Rasmussen, Torben Borup: *See—*
Kroyer, Karl Kristian Kobs; and Rasmussen, Torben Borup, 3,963,819.
Rasner, Gerhard: *See—*
Hauschulz, Bruno; von Barneveld, Heinrich; Jordan, Wilfried; Mertmann, Josef; Rasner, Gerhard; and Brenienek, Harri, 3,963,610.
Rautia, Veli Matti; and Asplund, Erkki Kalevi. Feeding screw for slide casting machine. 3,963,116, Cl. 198-213.000.
Ravoire, Jean: *See—*
Caillaud, Andre; Charuit, Pierre; Duffau, Claude; and Ravoire, Jean, 3,963,619.
Ray, Thomas J.; and Waehner, Glenn C., to United Technologies Corporation. Cathode ray tube phosphor protection circuit. 3,963,961, Cl. 315-381.000.
Raymond Lee Organization, The: *See—*
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Whitlock, Russell U., 3,963,263.
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Anderson, Roger G., 3,962,893.
Grimm, Helmut, 3,963,184.

Michaels, Chris T., 3,962,748.
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RCA Corporation: *See—*
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Crooks, Horatio Nelson, 3,963,861.
Eaton, Sargent Sheffield, Jr., 3,964,031.
Ettenberg, Michael; and Kressel, Henry, 3,963,536.
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Richter, Edwin William, 3,963,998.
Schade, Otto Heinrich, Jr., 3,963,963.
Stachel, Charles Peter; and Weingarten, Morris Robert, 3,962,765.
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Redmond, Stephen L.: *See—*
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Redpath Dorman Long (North Sea) Limited: *See—*
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Reed, Charles C.: *See—*
Cooley, Denton A.; Reed, Charles C.; and Sharp, Russell G., 3,963,028.

Reese, Gerald D., to Scorpion, Inc. Snowmobile construction having drive belt offset from center line of ski spindles. 3,963,083, Cl. 180-5.00R.

Regie Nationale des Usines Renault: *See—*
Rivere, Jean-Pierre, 3,963,987.

Rehm, Gustav A., to Aqua-Chem, Inc. Heat transfer fluid heater with continuously flushed vent and drain. 3,962,999, Cl. 122-248.000.

Reilly, Joseph R.; and Schon, Lars G., to Monsanto Company. Method and apparatus improvements for trimming plastic articles. 3,962,938, Cl. 82-47.000.

Reinker, Dieter: *See—*
Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, 3,963,431.

Reker, Joseph Robert, to Du Pont de Nemours, E. I., and Company. Spinneret assembly for multifilament yarns. 3,963,406, Cl. 425-463.000.

Remus, Casimer Frank, to Bendix Corporation, The. Vertical scale take up mechanism. 3,964,049, Cl. 340-317.000.

Renfrew, Andrew Hunter Morris: *See—*
Hughes, Nigel; and Renfrew, Andrew Hunter Morris, 3,963,853.

Rennemann, Albert, to Johann Birkart, Internationale Spedition. Hanging fitting for freight receptacles, known as containers. 3,963,290, Cl. 312-321.000.

Renner, Hans-Joachim: *See—*
Jockel, Heinz; and Renner, Hans-Joachim, 3,963,642.

Rentema, Albertus Pieter, to U.S. Philips Corporation. Trimming unit. 3,962,783, Cl. 30-34.100.

Reus, Josef: *See—*
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Reynolds, Charles Edward; and Weidler, Charles Harry, to AMP Incorporated. Small magnet wire to lead wire termination. 3,963,857, Cl. 174-84.00C.

Reynolds, Dwight W.: *See—*
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Ricardo & Co. Engineers (1927) Ltd.: *See—*
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Rice, Edwin E.: *See—*
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Richards, Glenn L.: *See—*
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Pommerening, Uwe A.; and Richards, Glenn L., 3,963,874.

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Richey, Kenneth Rutherford: *See—*
Blackwood, Wilfred Norman; Gallagher, Finbar Joseph; Richey, Kenneth Rutherford; and Marshall, William, 3,963,904.

Richter, Edwin William, to RCA Corporation. Variable bandwidth tunable directional filter. 3,963,998, Cl. 333-73.00W.

Richter, Johan Christoffer Fredrik Carl, to Kamyr Aktiebolag. Recirculation of unconsumed oxygen pulp bleaching gas. 3,963,561, Cl. 162-17.000.

Rickard, James H., to Ovation Instruments, Inc. Magnetic induction stringed instrument pickup. 3,962,946, Cl. 84-1.150.

Riede, John R., to Riede Systems, Inc. Multi-angle tilt switch device with adjustable oscillating controller. 3,963,888, Cl. 200-61.480.

Riede Systems, Inc.: *See—*
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Riedel, Alfred: *See—*
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Rieger, Hermann, to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH. Safety ski binding. 3,963,253, Cl. 280-616.000.

Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Expansion bearing assembly for a converter carrying trunnion. 3,963,281, Cl. 308-6.00R.

Riitano, Dott. Francesco: *See—*
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Riitano, Francesco; and Cassani, Nino, to a.r.l. C.I.R. (Cooperativa Industriale Romagnola); and Riitano, Dott. Francesco. Endodontic instrument. 3,962,790, Cl. 32-40.00R.

Rinkers, William P.: *See—*
Hoffman, Gary R.; and Rinkers, William P., 3,963,993.

Rishovd, Sigurd A.; and Vizenor, Richard P., to Royal Industries, Inc. Wheel alignment apparatus. 3,963,352, Cl. 356-152.000.

Rivere, Jean-Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Method and apparatus for digital calculation of rotational speed of an internal combustion engine. 3,963,987, Cl. 324-166.000.

Rizzi, George Peter; and Taylor, Harry Madison, to Procter & Gamble Company, The. Synthesis of higher polyol fatty acid polyesters. 3,963,699, Cl. 260-234.00R.

RMI Company: *See—*
Bomberger, Howard B., Jr.; and Seagle, Stanley R., 3,963,525.

Roach, Jere H., to Cammann Mfg., Co., Inc. Adjustment device for metal disintegrators. 3,963,893, Cl. 219-69.00R.

Robert Bosch G.m.b.H.: *See—*
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Haubner, Georg; Hofer, Walter; and Meier, Werner, 3,963,015.
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Wossner, Gunter, 3,962,869.
Zweng, Josef; and Komaroff, Iwan, 3,963,939.

Roberti, Barney. Method of making a multiple ply wood article. 3,963,546, Cl. 156-69.000.

Roberts, Eugene L.; and Steffancin, Thomas J., to United States of America, Army. Steerable antenna null combiner system. 3,964,065, Cl. 343-100.0LE.

Roberts, Gerald E., to General Electric Company. Apparatus for measuring the resonant frequency and coefficient of coupling of a plurality of coupled piezoelectric resonators. 3,963,982, Cl. 324-56.000.

Robertshaw Controls Company: *See—*
Bible, Harley V., 3,963,042.
Zajac, Chester J., 3,963,946.

Robey, Gerald E.: *See—*
Jureit, John Calvin; and Robey, Gerald E., 3,963,452.

Robinson, Eric Richard, to Dennison Manufacturing Company. Removal of faulty material in the manufacture of non-metallic webs. 3,962,730, Cl. 2-243.00B.

Robson, John Howard; and Marcus, Erich, to Union Carbide Corporation. Amine acrylate addition reaction products. 3,963,771, Cl. 260-482.00R.

Rockwell International Corporation: *See—*
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Roevens, Leopold Frans Cornell: *See—*
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Rolls-Royce Motors Limited: *See—*
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Rolls-Royce (1971) Limited: *See—*
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Rolschau, David W. Dust filter apparatus. 3,963,467, Cl. 55-284.000.

Romano, James, to Lawrence Peska Associates, Inc., a part interest. Illuminated safety helmet. 3,963,917, Cl. 240-60.000.

Rood, William H.: *See—*
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Root-Lowell Manufacturing Co.: *See—*
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Roper, David H. Traffic control device. 3,963,363, Cl. 404-11.000.

Rosaen, Nancy: *See—*
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Rosaen, Nils O., to Rosaen, Nancy, a part interest. Flow indicator with weight biasing means. 3,962,918, Cl. 73-228.000.

Rosbottom, Margaret Ann: *See—*
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Rosenberg, Richard: *See—*
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Rosenberg, Sheldon R. Security device. 3,963,269, Cl. 292-346.000.

Ross, Cecil J., to W. R. Weaver Company. Erector assembly retainer for telescopic rifle sights. 3,962,795, Cl. 33-246.000.

Ross, William Lawrence: *See—*
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Rotaflex (Great Britain) Limited: *See—*
Heritage, Robert, 3,963,294.

Rotello, Joseph Vincent. Comfort athletic supporter. 3,963,022, Cl. 128-158.000.

Rothenborg Patent & Licens K/S: *See—*
Hedegaard, Arne Marius; and Jensen, Hugo Sand, 3,962,980.
Rothwell, Michael Tom: *See—*
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Rouzaud, Guy Charles, to Centre Technique Industriel dit: Institut Textile de France; and Societe Anonyme dite: Jaeger. Knitting machine. 3,962,891, Cl. 66-132.00R.
Rowe International Inc.: *See—*
Oosterhouse, Gerard J., 3,964,025.
Rowedder, Gustav: *See—*
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Rowley, James R.: *See—*
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Ruark, Bruce L.: *See—*
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Rudolph, Paul: *See—*
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Ruede, Ernst, to Maschinenfabrik Fahr Aktiengesellschaft. Threshing machine. 3,963,032, Cl. 130-27.00E.
Rulseh, Roy M., to Aqua-Chem, Inc. Burner. 3,963,182, Cl. 239-404.000.
Rumble, Richard Roy. Storage devices. 3,963,287, Cl. 312-197.000.
Rummelhoff, Eric: *See—*
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Rumpf, John R. Tile board for constructing ceramic tile sheets. 3,963,232, Cl. 269-254.0CS.
Runberg, Richard K.; and Runberg, Shirley M. Make up guard. 3,963,034, Cl. 132-9.000.
Runberg, Shirley M.: *See—*
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Ruth, Arthur P. Animal feeder. 3,962,997, Cl. 119-51.110.
Rutherford, Talmadge O. Wind indicator. 3,964,038, Cl. 340-241.000.
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Ruti-Te Strake B.V.: *See—*
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Rydell, Nils Folke, to Saab-Scania Aktiebolag. Fluid forming apparatus having controllably variable forming pressure. 3,962,895, Cl. 72-63.000.
Ryder, Francis E.; and Mueller, Theodore H., to Ryder International Corporation. Checklist device. 3,962,808, Cl. 40-104.020.
Ryder International Corporation: *See—*
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Saito, Hachiro: *See—*
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Saito, Masaaki; and Minami, Hidehiro, to Nissan Motor Co., Ltd. Method and device for adjusting engine exhaust gas recirculation control. 3,963,011, Cl. 123-119.00A.
Sakaguchi, Shinji: *See—*
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Sakai, Jiro: *See—*
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Sakashita, Noriji; and Kameyama, Seiji, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 3,962,944, Cl. 84-1.010.
Sakoda, Tadami; and Suzuki, Tetsuhiko, to Toyo Kogyo Co., Ltd. Water soluble core for pressure die casting and process for making the same. 3,963,818, Cl. 264-56.000.
Sakurai, Takeo: *See—*
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Salmon, Michel: *See—*
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Sambrook, David John, to Imperial Metal Industries (Kynoch) Limited. Composite materials. 3,963,425, Cl. 29-191.400.
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Cooke, George A.; and Houlihan, William J., 3,963,717.
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Sanglert, Benkt, to Saab-Scania Aktiebolag. Apparatus for scanning cants to determine optimum edging cuts. 3,963,938, Cl. 250-561.000.
Sanko Mokkoki Co., Ltd.: *See—*
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Sankyo Company Limited: *See—*
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Sapir, Said, to International Telephone and Telegraph Corporation. Anti-skid brake control system and failsafe circuit therefor. 3,963,943, Cl. 307-235.00T.
Sarid, Iris. Foldable structure. 3,962,816, Cl. 46-1.00R.
Sarkar, Nikhil K. Dental amalgam alloys. 3,963,484, Cl. 75-173.00C.
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Satake, Yoshihiro, to Copal Company Limited. Control circuit for servo-motors. 3,963,970, Cl. 318-640.000.
Sato, Iwao: *See—*
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Sawaguchi, Yoji; and Ogawa, Katsumasa, to Fujitsu Ltd. Night depository control system. 3,963,900, Cl. 235-61.70B.
Saxton, Ronald Luther, to Du Pont de Nemours, E. I., and Company. Two step continuous polymerization method to form acrylonitrile copolymers. 3,963,687, Cl. 526-66.000.
Sayama, Norio: *See—*
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Schantz, Spencer C. Electro-magnetic assembly. 3,964,005, Cl. 335-124.000.
Scharfetter, Donald Lee: *See—*
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Schenk, Jan M., to United States of America, Navy. Missile launching and hold-down device therefor. 3,962,951, Cl. 89-1.810.
Schenk, Peter, to Dzus Fastener Co., Inc. Shaft attachment assembly. 3,963,361, Cl. 403-255.000.
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Schiemichen, Peter, to Deutsche Babcock & Wilcox Aktiengesellschaft. Off-shore power plant. 3,962,877, Cl. 61-46.500.
Schijven, Lucas Wilhelmus Martinus, to U.S. Philips Corporation. Pushbutton device for mechanical preselection tuning. 3,964,000, Cl. 334-7.000.
Schilling, Franz: *See—*
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Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Machines for texturizing synthetic polymer filaments. 3,962,829, Cl. 57-34.0HS.

Schlauer, Johann: *See—*
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Schleifenbaum, Karl; and Schweisfurth, Werner, to Meteor-Siegen Apparatebau Paul Schmeck GmbH. Apparatus for metering copy material in blueprint machines. 3,962,940, Cl. 83-208.000.

Schlienger, Inc.: *See—*
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Schlienger, Max P., to Schlienger, Inc. Method and apparatus for making high purity metallic powder. 3,963,812, Cl. 264-8.000.

Schlitt, Leland G.: *See—*
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Schmitt, Charles R., to United States of America, Energy Research and Development Administration. Fire extinguishant for fissionable material. 3,963,626, Cl. 252-2.000.

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Schmutzer, Joel J.: *See—*
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Neidhard, Horst; Linder, Ernst; Wahl, Josef; Schmidt, Peter Jurgen; and Schoeck, Peter A., 3,962,866.

Schoenbachler, Bernard W.; and Ruark, Bruce L., to General Electric Company. Air conditioning system for a mobile home. 3,962,885, Cl. 62-239.000.

Scholer, Alfred, to Vorwerk & Sohn, Textil- und Gummiwerke. Pleatable curtain. 3,963,067, Cl. 160-348.000.

Schon, Lars G.: *See—*
Reilly, Joseph R.; and Schon, Lars G., 3,962,938.

Schoppe, Wayne F.: *See—*
Taylor, Thomas N.; and Schoppe, Wayne F., 3,963,339.

Schreiber, Bruno; Seiz, Wolfgang; and Forster, Ewald, to Ciba-Geigy Corporation. Storage-stable, quick-curing epoxide resin moulding materials. 3,963,666, Cl. 260-37.0EP.

Schreiber, Bruno; Diethelm, Hermann; Habermeier, Jurgen; and Forster, Ewald, to Ciba-Geigy Corporation. Storage-stable moulding compositions for the manufacture of light-stable, tracking-resistant plastics. 3,963,667, Cl. 260-37.0EP.

Schreier, Ulrich: *See—*
Dumesnil, Maurice E.; and Schreier, Ulrich, 3,963,505.

Schroder, Johann: *See—*
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Schroter, Hans-Jurgen: *See—*
Stumpf, Willy; Queiser, Horst; Juntgen, Harald; Schroter, Hans-Jurgen; and Knoblauch, Karl, 3,963,460.

Schultz, Russell H., to Natural Resource Systems, Inc. Combustion furnace and infra-red radiant heating system. 3,963,018, Cl. 126-91.00A.

Schumacher, William Ludlow; and Volinskie, Robert, to AMP Incorporated. Coaxial ribbon cable terminator. 3,963,319, Cl. 339-176.0MF.

Schutz, Siegismund; Behner, Otto; and Hoffmeister, Friedrich, to Bayer Aktiengesellschaft. Basic oximes and their preparation. 3,963,778, Cl. 260-566.0AE.

Schwab, Kurt, to D. Swarovski & Co., Glasschleiferei. Reflex light reflector sheet and method for its manufacture. 3,963,309, Cl. 350-104.000.

Schwalm, Bruce D.; and Webb, Bryant F., to Sperry Rand Corporation. Method of converting an implement frame from a forward harvesting mode to a lateral transport mode. 3,962,853, Cl. 56-228.000.

Schwam, Harvey: *See—*
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Schwander, Hans Rudolf: *See—*
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Schwartz, Kenneth P.; and Wagner, Paul M. Reversible replaceable tread tire. 3,963,066, Cl. 152-187.000.

Schwartz, Michel S.; and Blasnik, William, to Lerner Manufacturing, Inc. Garment hanger construction. 3,963,154, Cl. 223-85.000.

Schweisfurth, Werner: *See—*
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Scolaro, Barbara; and Spector, George. Baby bottle handle. 3,963,206, Cl. 248-105.000.

Scorpion, Inc.: *See—*
Reese, Gerald D., 3,963,083.

Scripto, Inc.: *See—*
Lockwood, John C.; and Vaughan, Harry L., 3,963,413.

Seabourn, Ed O., to Phillips Petroleum Company. Coated shaker screen apparatus and method. 3,963,605, Cl. 209-2.000.

Seagle, Stanley R.: *See—*
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Sears, James S.: *See—*
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Seccombe, Robert J.: *See—*
Spyridakis, Emanuel G.; Rice, Edwin E.; and Seccombe, Robert J., 3,962,910.

Segre, Joseph Pipo; and Truscott, Norman R., to American Optical Corporation. Erbium laser ceilometer. 3,963,347, Cl. 356-5.000.

Seiler, Georg. Socket connection of tubes or tubular elements, in particular of metal. 3,963,298, Cl. 339-95.00R.

Seismic Logs, Inc.: *See—*
Morris, Harold B., 3,963,093.

Seiz, Wolfgang: *See—*
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Seki, Shigeo: *See—*
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Seki, Shigeru; Kato, Taketoshi; Itou, Toshikuni; and Sasaki, Hiroo, to Ishizuka Garasu Kabushiki Kaisha. Sintered metallic composite material. 3,963,449, Cl. 29-182.500.

Sekido, Isao: *See—*
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Sekiya, Masaaki: *See—*
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Sekmakas, Kazys, to DeSoto, Inc. Electrodeposition of thermosetting coatings at the cathode. 3,963,663, Cl. 260-29.300.

Selch, Grant J.: *See—*
Deloy, Joseph T.; and Selch, Grant J., 3,963,181.

Sellberg, Florian; and Weissglas, Peter, to Institutet for Mikrovagsteknik. Mixer stage for microwave receivers. 3,963,989, Cl. 325-449.000.

Sells, Fred E., to National Controls Corporation. Motion responsive detector apparatus. 3,963,919, Cl. 250-231.0SE.

Selvin, Gerald J.: *See—*
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Selz, Francois: *See—*
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Senak, Peter, Jr.: *See—*
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Senderoff, Seymour; and Mellors, Geoffrey W., to Union Carbide Corporation. Solids ionically conductive at elevated temperatures. 3,963,518, Cl. 136-83.00T.

Senju Metal Industry Co. Ltd.: *See—*
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Sequin, Carlo Heinrich; and Wilde, Peter Van Dyke, to Bell Telephone Laboratories, Incorporated. Semiconductor charge transfer devices with dark current background cancellation. 3,963,942, Cl. 307-221.00D.

Serdex - Societe d'Etudes, de Recherches, de Diffusion et d'Exploitation: *See—*
Pinhas, Henri; and Susini, Monique, 3,963,758.

Sero, Samuel J. Apparatus for expandably engaging the walls of an earthen hole. 3,962,837, Cl. 52-158.000.

Serriere, Jean-Luc: *See—*
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Setty, H. S. N.; Yaws, Carl L.; Martin, Bobby Ray; and Wangler, Daniel Joseph, to Texas Instruments Incorporated. Method of operating a quartz fluidized bed reactor for the production of silicon. 3,963,838, Cl. 427-213.000.

Sevcon Engineering Limited: *See—*
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Seydl, Wolfgang: *See—*
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Shallenberger, Fred T., Jr., to Metal Cutting Tools, Inc. Drill with indexable inserts. 3,963,365, Cl. 408-186.000.

Shapiro, Jonathan Salem, to Machlett Laboratories, Incorporated, The. X-ray tube current monitor. 3,963,931, Cl. 250-416.00R.

Sharp, Andrew Peter. Miniature tape cartridge and adaptor. 3,963,189, Cl. 242-55.19A.

Sharp, Colin Keith: *See—*
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Sharp, David E. Pollen dispensing apparatus. 3,962,821, Cl. 47-1.410.

Sharp, Russell G.: *See—*
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Sheel, Ronald S.: *See—*
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Sheldon, Stewart L.; Horstman, Wilbur R.; and Gump, Robert G. 3 Dimension projector. 3,963,332, Cl. 352-60.000.

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Sherlock, John W.: *See—*
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Shiba, Keisuke; Naito, Hideki; Yamamoto, Nobuo; and Yoneyama, Masakazu, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 3,963,499, Cl. 96-100.000.

Shibatani, Juichi: *See—*
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Shibuya, Atsumi; Sugita, Chokichi; and Endo, Hiroshi, to Nippon Concrete Kogyo Kabushiki Kaisha. Concrete piles, poles or the like. 3,963,056, Cl. 138-175.000.

Shichman, Daniel; and Percarpio, Edward P., to Uniroyal Inc. Bladder for shaping pneumatic tire. 3,963,394, Cl. 425-51.000.

Shih, Chi-Kai, to Du Pont de Nemours, E. I., and Company. Blend of ethylene copolymer elastomer and a copolyetherester elastomer. 3,963,802, Cl. 260-873.000.

Shima, Takeo: *See—*
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Shimada, Osamu: *See—*
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Shimazaki, Mamoru, to Canon Kabushiki Kaisha. Film transport apparatus for a motion picture camera or projector. 3,963,334, Cl. 352-191.000.

Shimazaki, Mamoru: *See—*
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Shimotsuma, Sakae; Hosoi, Masahiro; Kuratsuji, Takatoshi; Kawase, Shoji; and Shima, Takeo, to Teijin Limited. Extrusion-molded article having good thermal stability. 3,963,844, Cl. 428-36.000.

Shinkarenko, Ljubov Nikolaevna; Babenko, Julia Semenovna; and Grigoriev, Evgeny Fedorovich. Lytic enzyme and method of preparing same. 3,963,577, Cl. 195-62.000.

Shinoda, Hidenori: *See—*
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Shiono, Takashi: *See—*
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Shirai, Shinji: *See—*
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Shkarlet, Jury Mikhailovich. Ultrasonic instrument for non-destructive testing of articles with current-conducting surface. 3,963,980, Cl. 324-40.000.

Shkuratov, Igor Yakovlevich: *See—*
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Shoreline Precast Company: *See—*
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Shotbolt, Keith; and Von Bismarck, Gottfried, to W. R. Grace & Co. Closure lining machine. 3,963,396, Cl. 425-135.000.

Shugart Associates, Inc.: *See—*
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Shutt, Thomas Clifford; and Campbell, Howard, to Glass Container Manufacturers Institute, Inc. Fired construction shapes and process and binder therefor. 3,963,506, Cl. 106-67.000.

Sieghartner, Leonard J., to Roy E. Roth Company. Multi-stage pump. 3,963,371, Cl. 415-199.00T.

Siemens Aktiengesellschaft: *See—*
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Sigafoose, Glen. Method of assembling model airplane. 3,963,554, Cl. 156-304.000.

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Simmonds Precision Products, Inc.: *See—*
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Singleton, Ogle R., Jr., to Reynolds Metals Company. Brazing materials. 3,963,454, Cl. 29-197.500.

Sivertz, Christian; and Basilone, Anthony J., to London Laboratories Limited Co. Deposition of copper. 3,963,842, Cl. 427-305.000.

Skagerlund, Lars-Erik; and Stalfors, Rolf Lennart, to AB Bofors. Device for emitting radiation, for a projectile, shell etc. 3,962,972, Cl. 102-70.20R.

Skerlos, Peter Constantine, to Zenith Radio Corporation. Oscillation system for integrated circuit. 3,963,996, Cl. 331-117.00R.

SKF Industrial Trading and Development Company, B.V.: *See—*
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Skidmore, Richard H., to W Bar E, Incorporated. Apparatus and method for producing solid polymeric material from a dilute polymer solution. 3,963,558, Cl. 159-2.00E.

Skimming, William Sutton Baker, to Worcester Royal Porcelain Co., Ltd., The. Packaging means for fragile articles. 3,963,166, Cl. 229-14.00C.

Skinner, Robert Ivan; and Heine, Arnold John, to New Zealand Inventions Development Authority. Hysteretic energy absorber. 3,963,099, Cl. 188-1.00C.

Sloan, Albert Everett: *See—*
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Smart, Bruce Edmund, to Du Pont de Nemours, E. I., and Company. Methoxyperfluorocycloalkenium hexafluoroantimonate salts. 3,963,767, Cl. 260-446.000.

Smida, George R. Hydraulic chuck. 3,962,769, Cl. 29-202.00D.

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Smith, Carl Mayn; and Tiers, George V. D., to Minnesota Mining and Manufacturing Company. Silicone-compatible phthalocyanine dyestuffs. 3,963,744, Cl. 260-314.500.

Smith, Clarence M., deceased (by Smith, Mary M., executrix), to Westinghouse Electric Corporation. Wiring device with self-grounding element. 3,963,292, Cl. 339-14.00R.

Smith, Fred, to Anglian Water Authority. Process of preparing sodium-aluminum silicate dispersion complex and composition. 3,963,640, Cl. 252-313.00R.

Smith, Mary M., executrix: *See—*
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Smith, Michael: *See—*
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Smith, William J., to Royal Business Machines, Inc. Single element typehead positioning mechanism. 3,963,109, Cl. 197-55.000.

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Smollett, Thomas J.; and Stipanovic, Bozidar, to Coral Chemical Company. Stainless steels coated with black oxides. 3,963,530, Cl. 148-31.500.

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Soares, John M. Exhaust muffler for competition car engines. 3,963,092, Cl. 181-44.000.

Societa' Farmaceutici Italia S.p.A.: *See—*
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Societe Anonyme Automobiles Citroen: *See—*
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Sofiltra, Societe Industrielle de Filtration: *See—*
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Sonoyama, Takayasu; Tani, Hiroyoshi; Kageyama, Bunji; Kobayashi, Kobee; Honjo, Tahiko; and Yagi, Shigeo. Process for producing 2-keto-L-gulonic acid. 3,963,574, Cl. 195-30.000.
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Spadini, Gianfranco Luigi; and Dekker, Bob, to Procter & Gamble Company, The. Liquid detergent composition. 3,963,649, Cl. 252-546.000.
Spanke, Theodore J. Retractable ladder rack. 3,963,136, Cl. 214-450.000.
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Spinner, Georg. Cable connector for solid-insulation coaxial cables. 3,963,320, Cl. 339-177.00R.
Spivey, Jack B. Watertight light assembly. 3,963,915, Cl. 240-7.10R.
Spray Tech Corporation: *See—*
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Staba, Edward Anthony, to Olin Corporation. Priming formulation for rim fire ammunition. 3,963,544, Cl. 149-23.000.
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Stafford, Josephine C. Luggage wheels. 3,963,256, Cl. 280-35.000.
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Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Start-spinning apparatus which travels along an open-end spinning machine. 3,962,855, Cl. 57-34.00R.
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Stanley, Richard B. Antifriction roller bearing. 3,963,286, Cl. 308-205.000.
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Star Paper Limited: *See—*
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Stark, Howard M.; and Goren, Robert N., to Xerox Corporation. Curved screen. 3,963,342, Cl. 355-4.000.
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Tielrooy, Robert Willem, to Van Dam Machine Corporation. Apparatus for supporting and printing non-circular containers. 3,962,970, Cl. 101-38.00A.

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Tietjens, Eduard Willem, to U.S. Philips Corporation. Dry-shaving apparatus. 3,962,784, Cl. 30-43.600.

Tillmann, Klaus Erich, to Berkenhoff & Drebes Gesellschaft mit beschrankter Haftung. Apparatus for the manufacture of wire. 3,962,898, Cl. 72-279.000.

Titus, Charles H.: *See—*
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Todd, Gregory M. Portable power package. 3,963,972, Cl. 320-2.000.

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Toki, Shigeyuki: *See—*
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Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Takagi, Michiyasu; and Oguchi, Toshihiko, 3,962,992.
Watanabe, Sadakazu; and Shinoda, Hidenori, 3,963,350.

Toledo, Emil, to Raytheon Company. Apparatus for plating elongated bodies. 3,963,569, Cl. 204-206.000.

Tollefson, Phillip J.: *See—*
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Tomaro, Patrick M., to Continental Hair Products, Inc. Shower head adapted to produce steady or pulsating flows. 3,963,179, Cl. 239-101.000.

Tomita, Tutomu: *See—*
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Tomlinson, Ronald A.: *See—*
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Torii, Taketsugu; and Nishio, Minoru. Window antenna and defroster for use in motor vehicle. 3,964,068, Cl. 343-704.000.

Torok, Ernest J.; Lund, Roger E.; and Simon, William J., to Sperry Rand Corporation. Oligatomic ferromagnetic film memory system utilizing field stabilized domains. 3,964,034, Cl. 340-174.0TF.

Tosa, Tetsuya: *See—*
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Crawford, John T., 3,963,089.

Townes, William E., Jr.; and Svedeman, Stanley P., to Texas Instruments Incorporated. Radar antenna having a screen supported by shaped slats. 3,964,071, Cl. 343-840.000.

Toyo Kogyo Co., Ltd.: *See—*
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Toyoda, Takashi, to Kabushiki Kaisha Oji Yuka Goseishi Kenkyujo. Paper for adhesive stickers and the like. 3,963,851, Cl. 428-305.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Tred-X Corporation: *See—*
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Treugut, Andreas; and Bottcher, Jurgen, to Modell-System-Beratung Dietmar Stegmann, Heinrich Koller. Chess game for three people. 3,963,242, Cl. 273-131.00L.

Trevoy, Donald J., to Eastman Kodak Company. Silver halide element containing an organic semiconductor. 3,963,498, Cl. 96-87.00A.

Tribbett, Murray C.; and Manko, Nicholas L., to French Oil Mill Machinery Company, The. Self closing door for baling press. 3,962,968, Cl. 100-215.000.

Trio Electronics Incorporated: *See—*
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Trochimowski, Jaroslav George. Tone arm for record player. 3,963,246, Cl. 274-23.00R.

Troutner, Arthur L.; Russell, John R.; Johnson, Alan W.; and Johnson, Clifford R., to Trus Joist Corporation. Method of feeding sheets to a continuous laminating press. 3,963,552, Cl. 156-299.000.

Trowbridge, Leonard D.; and Trowbridge, Naomi A. Twirling baton with brake. 3,962,949, Cl. 84-477.00B.

Trowbridge, Naomi A.: *See—*
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Truax, Nancy Rosbottom; and Rosbottom, Margaret Ann. Ball belt. 3,963,157, Cl. 224-5.00D.

Trubiano, Antoine. Shopping cart seat construction. 3,963,255, Cl. 280-33.99B.

Trudel, Roger. Coin wrapping device. 3,962,847, Cl. 53-212.000.

Trus Joist Corporation: *See—*
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Tsao, Utah, to Lummus Company, The. Recovery of 1,2-dichloroethane from vinyl chloride production effluent. 3,963,584, Cl. 203-49.000.

Tsuchiya, Noriyuki; Murano, Motohiro; and Murata, Seiichiro, to Sony Corporation. Automatic assembly apparatus for inserting electronic connecting pins to and/or for mounting electronic parts on printed circuit boards. 3,963,456, Cl. 29-203.00B.

Tsuchiya, Takashi: *See—*
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Tsujimoto, Kayoshi: *See—*
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Tsujimoto, Michihiro; Osawa, Kisuke; and Okubo, Ichiro, to Mitsui Toatsu Chemicals, Incorporated. Coloring of organic materials with asymmetric thioindigoid compounds. 3,963,429, Cl. 8-38.000.

Tsukahara, Hirokazu; and Emoto, Kazuhiro, to Mitsubishi Paper Mills, Ltd. Novel organic photoconductive compound. 3,963,779, Cl. 260-570.00R.

Tsunashima, Eiichi, to Matsushita Electric Industrial Co., Ltd. Soldering flux. 3,963,529, Cl. 148-25.000.

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Tucker, Council A., to American Telecommunications. Contact and contact assembly. 3,963,318, Cl. 339-97.00P.

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Tuckwell, Clayton K., to National Presto Industries, Inc. Electric cooking appliance. 3,963,898, Cl. 219-524.000.

Tullio, Victor, to Du Pont de Nemours, E. I., and Company. Yellow disazo acid dye solution. 3,963,418, Cl. 8-41.00B.

Tully, Michael J., to Xerox Corporation. Color electrophotographic printing machine. 3,963,341, Cl. 355-4.000.

Turnbo, Roy G., to Tenneco Chemicals, Inc. Fire-retardant thermosetting resinous compositions. 3,963,671, Cl. 260-45.70R.

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Turzillo, Lee A. Reinforced pile in earth situs and method of producing same. 3,962,879, Cl. 61-53.520.

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Ueno, Katsujiro; Sato, Makoto; Arimoto, Masahiro; Kojima, Hiroshi; Yamasaki, Terukiyo; and Sakurai, Takeo, to Daiichi Seiyaku Co., Ltd. 1,2 Disubstituted benzimidazole derivatives. 3,963,727, Cl. 260-293.600.

Ueno, Takahiro. Convertible engine-air compressor apparatus for driving a vehicle. 3,963,379, Cl. 417-237.000.

Ueno, Zene: *See—*
Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, 3,963,000.

Ugo, John Walter, to Uniroyal Inc. Method for improving tire uniformity. 3,963,427, Cl. 51-281.00R.
Ullrich, Martin; Meisert, Ernst; and Eitel, Alfred, to Bayer Aktiengesellschaft. Process for the production of polyurethane elastomers. 3,963,679, Cl. 260-75.0NE.
Ulnic France: *See—*
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Umemoto, Sueo: *See—*
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Union Carbide Corporation: *See—*
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van der Lely, Cornelis. Methods for the manufacture of prefabricated building sections or room units and factories for the implementation of such methods. 3,962,773, Cl. 29-430.000.
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van der Lely, Cornelis. Soil cultivating implements. 3,963,078, Cl. 172-119.000.
Van Duuren, Hendrik Cornelis Anthony; and da Silva, Herman, to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Method for indicating a free-line state in a binary data communication system. 3,963,867, Cl. 178-69.00G.
van Duynhoven, Adrianus Henricus, to Ruti-Te Strake B.V. Device for manipulating yarns. 3,963,229, Cl. 269-8.000.
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Cornell; and Van Laerhoven, Willy Joannes, to Janssen Pharmaceutica. Tetrahydropyrimidines. 3,963,718, Cl. 260-256.40H.
Van Laerhoven, Willy Joannes: *See—*
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Van Wuytswinkel, Charles M. G., to Caterpillar Tractor Co. Track roller frame and final case mounting. 3,963,278, Cl. 305-12.000.
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Victor, Harold Richard. Carpet stretcher. 3,963,216, Cl. 254-62.000.

Vinard, Daniel Robert, to Norton Company. Blow molding process for manufacturing grinding wheels. 3,963,459, Cl. 51-298.00A.

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Vinton, David S., to Caterpillar Tractor Co. Planetary four wheel drive system having plural modes of operation. 3,963,085, Cl. 180-44.00R.

Vis, Vincent A., to J. M. Richards Laboratories. Leakage and continuity tester. 3,963,981, Cl. 324-51.000.

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Voituriez, Henry; and Aymard, Rene, to Union Siserugique du Nord et de l'Est de la France. Charging device for a blast-furnace. 3,963,128, Cl. 214-35.00R.

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Vornberger, Walter, to International Shoe Machine Corporation. Heel and side lasting machine. 3,962,741, Cl. 12-10.500.

Vornberger, Walter, to International Shoe Machine Corporation. Cement lasting the side and heel portions of a shoe assembly. 3,963,840, Cl. 427-284.000.

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Wadham, Eric, to U.S. Philips Corporation. Semiconductor devices with conductive layer structure. 3,964,092, Cl. 357-68.000.

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B 24,018	3,914,206	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 291,104	3,925,007	Dec. 9, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 314,271	3,921,845	Nov. 25, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 318,618	3,915,365	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,452	3,925,083	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,603	3,915,571	Oct. 28, 1975
B 288,018	3,925,239	Dec. 9, 1975	B 321,018	3,921,623	Nov. 25, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 321,101	3,917,163	Nov. 4, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,803	3,919,470	Nov. 11, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,240	3,925,693	Dec. 9, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,910	3,925,696	Dec. 9, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 361,734	3,915,764	Oct. 28, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 362,589	3,914,012	Oct. 21, 1975	B 386,592	3,925,305	Dec. 9, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 387,039	3,924,510	Dec. 9, 1975
B 363,337	3,928,639	Dec. 23, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,154	3,923,809	Dec 2, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 370,453	3,964,101	Jun. 15, 1976	B 394,300	3,914,159	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 406,800	3,952,708	Apr. 27, 1976
B 382,840	3,922,007	Nov. 25, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,657	3,927,362	Dec. 16, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21 1975
B 411,145	3,914,168	Oct. 21 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JUNE, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Process and apparatus for automated regulation of sulphur production units. Re. 28,864, Cl. 23-255.00R.

Andriessen, Wilhelmus: *See*—
Schaeffer, Norbert; Fitterer, Horst; Uhl, Karl; Schnell, Georg; and Andriessen, Wilhelmus, Re. 28,863.

Arnold, Peter: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., Re. 28,860.

Baba, Takeshi; Shibuya, Kenji; Maruhama, Tetsuro; Nakahara, Tsuneo; and Yoshida, Kenichi, to Sumitomo Electric Industries, Ltd. Moving object communication control system. Re. 28,867, Cl. 325-51.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Schaeffer, Norbert; Fitterer, Horst; Uhl, Karl; Schnell, Georg; and Andriessen, Wilhelmus, Re. 28,863.

Beaumont, Richard W., to Joy Manufacturing Company. Rock drill. Re. 28,859, Cl. 173-105.000.

Brown & Williamson Tobacco Corporation: *See*—
Litzinger, Elmer Francis, Re. 28,858.

Campbell, Jack B., to Eli Lilly and Company. Selective dehalogenation. Re. 28,865, Cl. 260-251.00R.

Carmassi, Michel: *See*—
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, Re. 28,864.

Cosmopolitan Textile Company, Ltd.: *See*—
Wildeman, Arno Edgar, Re. 28,857.

Cryogenic Engineering Company: *See*—
Leonard, Kenneth R., Re. 28,856.

Dunn, Francis P.: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., Re. 28,860.

Eli Lilly and Company: *See*—
Campbell, Jack B., Re. 28,865.

Fitterer, Horst: *See*—
Schaeffer, Norbert; Fitterer, Horst; Uhl, Karl; Schnell, Georg; and Andriessen, Wilhelmus, Re. 28,863.

Garriques, Alfred L.: *See*—
Siemonsen, Frederik A.; and Garriques, Alfred L., Re. 28,862.

Haefele, Joseph E.; Hawkins, Cecil R.; and Kubec, Ronald E., to International Business Machines Corporation. Magnetic recording coating. Re. 28,866, Cl. 428-336.000.

Hall, Samuel, Jr., to Plastic Container Corporation. Safety medicine bottle closure. Re. 28,861, Cl. 215-204.000.

Hawkins, Cecil R.: *See*—
Haefele, Joseph E.; Hawkins, Cecil R.; and Kubec, Ronald E., Re. 28,866.

International Business Machines Corporation: *See*—
Haefele, Joseph E.; Hawkins, Cecil R.; and Kubec, Ronald E., Re. 28,866.

Joy Manufacturing Company: *See*—
Beaumont, Richard W., Re. 28,859.

Kubec, Ronald E.: *See*—
Haefele, Joseph E.; Hawkins, Cecil R.; and Kubec, Ronald E., Re. 28,866.

Leonard, Kenneth R., to Cryogenic Engineering Company. Low-loss closed-loop supply system for transferring liquified gas from a large container to a small container. Re. 28,856, Cl. 62-54.000.

Litzinger, Elmer Francis, to Brown & Williamson Tobacco Corporation. Selective gas phase filter material. Re. 28,858, Cl. 131-267.000.

Louvel, Bernard: *See*—
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, Re. 28,864.

Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., to Shell Oil Company. Curved offshore well conductors. Re. 28,860, Cl. 175-9.000.

Maruhama, Tetsuro: *See*—
Baba, Takeshi; Shibuya, Kenji; Maruhama, Tetsuro; Nakahara, Tsuneo; and Yoshida, Kenichi, Re. 28,867.

Maurice, Jacques: *See*—
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, Re. 28,864.

Montrella, Anthony James. Swim training paddle. Re. 28,855, Cl. 9-307.000.

Nakahara, Tsuneo: *See*—
Baba, Takeshi; Shibuya, Kenji; Maruhama, Tetsuro; Nakahara, Tsuneo; and Yoshida, Kenichi, Re. 28,867.

Owens-Illinois, Inc.: *See*—
Siemonsen, Frederik A.; and Garriques, Alfred L., Re. 28,862.

Plastic Container Corporation: *See*—
Hall, Samuel, Jr., Re. 28,861.

Schaeffer, Norbert; Fitterer, Horst; Uhl, Karl; Schnell, Georg; and Andriessen, Wilhelmus, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Guide elements for magnetic tapes wound or to be wound in the form of packs on flangeless spools. Re. 28,863, Cl. 242-199.000.

Schnell, Georg: *See*—
Schaeffer, Norbert; Fitterer, Horst; Uhl, Karl; Schnell, Georg; and Andriessen, Wilhelmus, Re. 28,863.

Shell Oil Company: *See*—
Marshall, Peter W.; Arnold, Peter; and Dunn, Francis P., Re. 28,860.

Shibuya, Kenji: *See*—
Baba, Takeshi; Shibuya, Kenji; Maruhama, Tetsuro; Nakahara, Tsuneo; and Yoshida, Kenichi, Re. 28,867.

Siemonsen, Frederik A.; and Garriques, Alfred L., to Owens-Illinois, Inc. Easy open means for bottles and the like. Re. 28,862, Cl. 215-255.000.

Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See*—
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, Re. 28,864.

Sumitomo Electric Industries, Ltd.: *See*—
Baba, Takeshi; Shibuya, Kenji; Maruhama, Tetsuro; Nakahara, Tsuneo; and Yoshida, Kenichi, Re. 28,867.

Uhl, Karl: *See*—
Schaeffer, Norbert; Fitterer, Horst; Uhl, Karl; Schnell, Georg; and Andriessen, Wilhelmus, Re. 28,863.

Vandesande, Georges: *See*—
Andral, Guillaume; Carmassi, Michel; Louvel, Bernard; Maurice, Jacques; and Vandesande, Georges, Re. 28,864.

Wildeman, Arno Edgar, to Cosmopolitan Textile Company, Ltd. Apparatus for producing stitch bonded fabric. Re. 28,857, Cl. 112-438.000.

Yoshida, Kenichi: *See*—
Baba, Takeshi; Shibuya, Kenji; Maruhama, Tetsuro; Nakahara, Tsuneo; and Yoshida, Kenichi, Re. 28,867.

LIST OF PLANT PATENTEES

Byrum, Roy L., to Joseph H. Hill Co. Rose. 3,910, 6–15–76, Cl. 26.

Duffett, William E.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,906.
Jessel, Walter H., Jr., and Duffett. 3,907.
Jessel, Walter H., Jr., and Duffett. 3,908.

Hill, E. G. Co., Inc.: *See*—
Jelly, Robert G. 3,914.

Joseph H. Hill Co.: *See*—
Byrum, Roy L. 3,910.

Jelly, Robert G., to E. G. Hill Co., Inc. Rose plant named festive (seedling #8–69–RS). 3,914, 6–15–76, Cl. 29.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,906, 6–15–76, Cl. 74.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,907, 6–15–76, Cl. 78.

Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,908, 6–15–76, Cl. 77.

Mikkelsens Inc.: *See*—
Mikkelsen, James C. 3,911.
Mikkelsen, James C. 3,912.
Mikkelsen, James C. 3,913.

Mikkelsen, James C., to Mikkelsen Inc. Begonia plant. 3,911, 6–15–76, Cl. 68.

Mikkelsen, James C., to Mikkelsen Inc. Poinsettia plant. 3,912, 6–15–76, Cl. 86.

Mikkelsen, James C., to Mikkelsen Inc. Begonia plant. 3,913, 6–15–76, Cl. 68.

Vaughn Girazian: *See*—
Yamada, Yoshio. 3,915.

Weeks, O. L. Climbing rose plant. 3,909, 6–15–76, Cl. 4.

Yamada, Yoshio, to Vaughn Girazian. Nectarine tree. 3,915, 6–15–76, Cl. 41.

Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr., and Duffett. 3,906.
Jessel, Walter H., Jr., and Duffett. 3,907.
Jessel, Walter H., Jr., and Duffett. 3,908.

LIST OF DESIGN PATENTEES

A. Ahlstrom Osakeyhtio: *See*—
Sarpaneva, Timo T. 240,284.
Sarpaneva, Timo T. 240,285.
Sarpaneva, Timo T. 240,286.
Sarpaneva, Timo T. 240,287.

Beaumont, John A., to Polaroid Corp. Container for photographic camera or similar article. 240,292, 6–15–76, Cl. D9—232.

Bogart, James S., and J. M. Wilcox, to Federal-Mogul Corp. O-Ring measuring gauge. 240,293, 6–15–76, Cl. D10—70.

CITC Industries, Inc.: *See*—
Senter, Jonas. 240,280.

Clark Equipment Co.: *See*—
DePriester, Donald J., and Fuller. 240,294.

DePriester, Donald J., and D. C. Fuller, to Clark Equipment Co. Lift truck body. 240,294, 6–15–76, Cl. D12—61.

Dixson, Tommy W. Accessory console for motorcycles. 240,295, 6–15–76, Cl. D12—114.

Dixson, Tommy W. Accessory console for motorcycles. 240,296, 6–15–76, Cl. D12—114.

Etablissements Genoud & Cie: *See*—
Neyret, Guy. 240,303.
Neyret, Guy. 240,304.

Federal-Mogul Corp.: *See*—
Bogart, James S., and Wilcox. 240,293.

Fuller, Darrell C.: *See*—
DePriester, Donald J., and Fuller. 240,294.

Gelman, Charles, and A. Vadnay, to Gelman Instrument Co. Water filter or similar article. 240,300, 6–15–76, Cl. D23—4.

Gelman Instrument Co.: *See*—
Gelman, Charles, and Vadnay. 240,300.

Goldman, Arthur: *See*—
Horowitz, Jack, and Goldman. 240,282.

Hartz Mountain Corp., The: *See*—
Suchowski, Bernard, Lovitz, and Kissin. 240,305.
Suchowski, Bernard, Lovitz, and Kissin. 240,306.
Suchowski, Bernard, Lovitz, and Kissin. 240,307.

Hoffman, Wayne C. Pencil sharpener. 240,299, 6–15–76, Cl. D19—74.

Horowitz, Jack, and A. Goldman. Heel of a shoe. 240,282, 6–15–76, Cl. D2—325.

Kissin, Claud W.: *See*—
Suchowski, Bernard, Lovitz, and Kissin. 240,305.
Suchowski, Bernard, Lovitz, and Kissin. 240,306.
Suchowski, Bernard, Lovitz, and Kissin. 240,307.

Kline, Melbert A. Bicycle saddle bag. 240,298, 6–15–76, Cl. D12—158.

Lovitz, David D.: *See*—
Suchowski, Bernard, Lovitz, and Kissin. 240,305.
Suchowski, Bernard, Lovitz, and Kissin. 240,306.
Suchowski, Bernard, Lovitz, and Kissin. 240,307.

Marvin Glass & Associates: *See*—
Montague, Douglas P., and Morrison. 240,302.

Miller, James E. Combined picnic table and multiple bench unit. 240,283, 6–15–76, Cl. D6—45.

Montague, Douglas P., and H. J. Morrison, to Marvin Glass & Associates. Pole telephone. 240,302, 6–15–76, Cl. D26—14.

Montreal, Antoine T. Nestable stroller. 240,297, 6–15–76, Cl. D12—129.

Morrison, Howard J.: *See*—
Montague, Douglas P., and Morrison. 240,302.

Nash, James W. Door prop for preventing opening of the door. 240,290, 6–15–76, Cl. D8—203.

Neyret, Guy, to Etablissements Genoud & Cie. Lighter. 240,303, 6–15–76, Cl. D22—42.

Neyret, Guy, to Etablissements Genoud & Cie. Lighter. 240,304, 6–15–76, Cl. D27—42.

Orenstein, Henry. Toy dog figure. 240,308, 6–15–76, Cl. D34—2.

Orenstein, Henry. Toy pig figure. 240,309, 6–15–76, Cl. D34—2.

Page, Albert E. V., to Schenley Industries Inc. Bottle. 240,291, 6–15–76, Cl. D9—47.

Polaroid Corp.: *See*—
Beaumont, John A. 240,292.

Quabaug Rubber Co.: *See*—
Russell, Robert E. 240,281.

Russell, Robert E., to Quabaug Rubber Co. Boot sole. 240,281, 6–15–76, Cl. D2—320.

Sarpaneva, Timo T., to A. Ahlstrom Osakeyhtio. Drinking glass. 240,284, 6–15–76, Cl. D7—11.

Sarpaneva, Timo T., to A. Ahlstrom Osakeyhtio. Drinking glass. 240,285, 6–15–76, Cl. D7—11.

Sarpaneva, Timo T., to A. Ahlstrom Osakeyhtio. Drinking glass. 240,286, 6–15–76, Cl. D7—11.

Sarpaneva, Timo T., to A. Ahlstrom Osakeyhtio. Drinking glass. 240,287, 6–15–76, Cl. D7—11.

Schenley Industries Inc.: *See*—
Page, Albert E. V. 240,291.

Senter, Jonas, to CITC Industries, Inc. Sport shoe. 240,280, 6–15–76, Cl. D2—310.

Skinner, Warren. Container lid lifting tool. 240,289, 6–15–76, Cl. D8—40.

Sony Corp.: *See*—
Takanashi, Takao. 240,301.

Suchowski, Bernard, D. D. Lovitz, and C. W. Kissin, to The Hartz Mountain Corp. Combined aquarium aerator and ornament holder. 240,305, 6–15–76, Cl. D30—12.

Suchowski, Bernard, D. D. Lovitz, and C. W. Kissin, to The Hartz Mountain Corp. Rotary play exerciser for a pet. 240,306, 6–15–76, Cl. D30—42.

Suchowski, Bernard, D. D. Lovitz, and C. W. Kissin, to The Hartz Mountain Corp. Rotary play exerciser for domestic animals. 240,307, 6–15–76, Cl. D30—42.

Takanashi, Takao, to Sony Corp. Magnetic video reproducers. 240,301, 6–15–76, Cl. D26—14.

Vadnay, Attila: *See*—
Gelman, Charles, and Vadnay. 240,300.

Wilcox, John M.: *See*—
Bogard, James S., and Wilcox. 240,293.

Wright, Jeffrey D. Rolling pin cutter. 240,288, 6–15–76, Cl. D7—43.

CLASSIFICATION OF PATENTS

ISSUED JUNE 15, 1976

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

174 3,962,728
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112 3,962,732
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172.12 3,962,735

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334R 3,962,738

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10.5 3,962,741

CLASS 14

69.5 3,962,747

CLASS 15

201 3,962,742
229AP 3,962,743
250.34 3,962,744
322 3,962,745
340 3,962,746

CLASS 16

114R 3,962,748
135 3,962,749
168 3,962,750

CLASS 17

26 3,962,751
71 3,962,752

CLASS 19

156.3 3,962,753

CLASS 21

58 3,963,438

CLASS 23

230PC 3,963,439
230B 3,963,421
230R 3,963,420
253TP 3,963,442
253R 3,963,440
3,963,441
254E 3,963,422
255R Re.28,864
262 3,963,443
277C 3,963,444
288FA 3,963,447
288FB 3,963,448
288FC 3,963,445
288A 3,963,446
288R 3,963,423
296 3,963,424

CLASS 24

33B 3,962,754
201HL 3,962,755
205.16C 3,962,756
255BS 3,962,757
255GP 3,962,758
269 3,962,759

CLASS 26

72 3,962,760

CLASS 27

10 3,962,761

CLASS 28

72R 3,962,762

CLASS 29

6.1 3,962,763
25.13 3,962,764
3,962,765
157.3B 3,962,766
157.3R 3,962,767
173 3,962,768
182.5 3,963,449
191.4 3,963,425
3,963,450
193.5 3,963,452
196.1 3,963,451
197.5 3,963,453
3,963,454
198 3,963,455
202D 3,962,769
3,962,769
203B 3,963,456
203H 3,962,770
283 3,962,771
420 3,962,772
430 3,962,773
432 3,962,774
445 3,962,775
458 3,962,776
568 3,962,777
572 3,962,778
577 3,962,779
596 3,962,780
600 3,962,781
623 3,962,782

CLASS 30

34.1 3,962,783
43.6 3,962,784
90 3,962,785
168 3,962,786

CLASS 32

15 3,962,787
27 3,962,788
3,962,789
40R 3,962,790
57 3,962,791

CLASS 33

143L 3,962,792
143R 3,962,793
182 3,962,794
246 3,962,795
288 3,962,796
324 3,962,797

CLASS 34

9 3,962,798
54 3,962,799

CLASS 35

8B 3,962,800
17 3,962,801
19B 3,962,802

CLASS 37

66 3,962,803
126AA 3,962,804

CLASS 38

102.5 3,962,805

CLASS 40

33 3,962,806
78.15 3,962,807
104.02 3,962,808

CLASS 42

66 3,962,809

CLASS 43

8 3,962,810
3,962,811
17 3,962,812
19 3,962,813
54.5R 3,962,815
86 3,962,814

CLASS 46

1R 3,962,816
25 3,962,817
74D 3,962,818
164 3,962,819
221 3,962,820

CLASS 47

1.41 3,962,821
34.11 3,962,822
37 3,962,823
38.1 3,962,824
41.12 3,962,825
41.13 3,962,826

CLASS 48

197R 3,963,426
202 3,963,457

CLASS 49

384 3,962,827
468 3,962,828

CLASS 51

58 3,962,830
78 3,962,831
217L 3,962,832
281R 3,963,427
284 3,962,833
295 3,963,458
298A 3,963,459
323 3,962,834

CLASS 52

73 3,962,835
104 3,962,836
158 3,962,837
183 3,962,838
262 3,962,839
281 3,962,840
309 3,962,841
436 3,962,842
758F 3,962,843

CLASS 53

39 3,962,844
59R 3,962,845
124C 3,962,846
212 3,962,847
266A 3,962,848

CLASS 55

20 3,963,461
25 3,963,462
66 3,963,460
178 3,963,463
228 3,963,464
238 3,963,465
269 3,963,466
284 3,963,467

CLASS 56

10.2 3,962,849
27.5 3,962,850
126 3,962,851
202 3,962,852
228 3,962,853
370 3,962,854

CLASS 57

34HS 3,962,829
34R 3,962,855
52 3,962,856
59 3,962,857

CLASS 58

4A 3,962,858
23AC 3,962,860
23BA 3,962,859
39.5 3,962,861

CLASS 60

39.09R 3,962,862
39.14 3,962,863
39.16R 3,962,864
255 3,962,865
276 3,962,866
3,962,867
278 3,962,868
298 3,962,869
428 3,962,870
433 3,962,871
453 3,962,872
641 3,962,873
669 3,962,874

CLASS 61

1F 3,962,875
21 3,962,876
46.5 3,962,877
3,962,878
53.52 3,962,879
53.74 3,962,880

CLASS 62

9 3,962,881
54 Re.28,856
55 3,962,882
137 3,962,883
217 3,962,884
239 3,962,885
340 3,962,886
485 3,962,887
499 3,962,888

CLASS 64

32F 3,962,889

CLASS 65

3A 3,963,468
194 3,963,469

CLASS 66

64 3,962,890
132R 3,962,891

CLASS 68

23R 3,962,892

CLASS 70

19 3,962,893

CLASS 71

9 3,963,470
12 3,963,471
33 3,963,472
90 3,963,473
91 3,963,474
3,963,475
3,963,476
3,963,477
3,963,478
95 3,963,479
3,963,480

CLASS 72

19 3,962,894
63 3,962,895
82 3,962,896
209 3,962,897
279 3,962,898
334 3,962,899
379 3,962,900
410 3,962,901

CLASS 73

37 3,962,902
3,962,902
37.5 3,962,903
38 3,962,904
40.5R 3,962,905
41 3,962,906
55 3,962,907
64.1 3,963,349
67.7 3,962,908
67.8S 3,962,909
88F 3,962,910
88.5R 3,962,911
117 3,962,912
118 3,962,913
125 3,962,914
149 3,962,916
151 3,962,915
204 3,962,917
228 3,962,918
290R 3,962,919
356 3,962,920
398C 3,962,921
424 3,962,922

CLASS 74

10.33 3,962,923
50 3,962,924
143 3,962,925
230.17B 3,962,928
230.17E 3,962,927
230.8 3,962,926
243CS 3,962,929
473R 3,962,930
493 3,962,931
604 3,962,932
665GA 3,962,933
752E 3,962,934
812 3,962,935

CLASS 75

.5R 3,963,482
5 3,963,481
11 3,963,483
173C 3,963,484
212 3,963,485

CLASS 81

64 3,962,936

CLASS 82

1C 3,962,937
47 3,962,938

CLASS 83

51 3,962,939
208 3,962,940
228 3,962,941
311 3,962,942
370 3,962,943

CLASS 84

1.01 3,962,944
3,962,945
1.15 3,962,946
1.24 3,962,947
294 3,962,948
477B 3,962,949

CLASS 85

32R 3,962,950

CLASS 89

1.81 3,962,951

CLASS 90

11A 3,962,952
3,962,953

CLASS 91

401 3,962,955
412 3,962,954
418 3,962,956

CLASS 93

1R 3,962,957
20 3,962,958
35R 3,962,959

CLASS 96

1LY 3,963,486
1R 3,963,487
3,963,488
27H 3,963,490
27R 3,963,489
3,963,491
53 3,963,492
64 3,963,493
69 3,963,494
76C 3,963,496
76R 3,963,495
3,963,497
87A 3,963,498
100 3,963,499

CLASS 98

40C 3,962,960

CLASS 99

426 3,962,961
474 3,962,962
544 3,962,963

CLASS 100

51 3,962,964
99 3,962,965
156 3,962,966
191 3,962,967
215 3,962,968

CLASS 101

1 3,962,969
38A 3,962,970
42 3,962,971

CLASS 102

70.2R 3,962,972
80 3,962,973
81 3,962,974

CLASS 104

23FS 3,962,975

CLASS 106

14 3,963,500
20 3,963,501
38.28 3,963,502
40V 3,963,503
41 3,963,504
47R 3,963,505
67 3,963,506
86 3,963,507
104 3,963,508
273R 3,963,509
289 3,963,510
308M 3,963,512
308Q 3,963,511

CLASS 109

82 3,962,976

CLASS 110

38 3,962,977
165R 3,962,978

CLASS 112

98 3,962,979
252 3,962,980
438 Re.28,857

CLASS 114

.5F 3,962,981
235F 3,962,982
235R 3,962,983

CLASS 115

17 3,962,984
34R 3,962,985

CLASS 116

114W 3,962,986

CLASS 118

44 3,962,987
49.1 3,962,988
504 3,962,989
620 3,962,990
635 3,962,991
637 3,962,992

CLASS 119

19 3,962,993
3,962,994
29 3,962,995
51CF 3,962,996
51.11 3,962,997
56R 3,962,998

CLASS 122

248 3,962,999

CLASS 123

3 3,963,000
32EA 3,963,002
32D 3,963,001
32K 3,963,003
90.12 3,963,006
90.16 3,963,007
90.4 3,963,004
90.61 3,963,008
119A 3,963,011
119D 3,963,009
119R 3,963,005
122AC 3,963,010
3,963,012
133 3,963,013
139R 3,963,014
148CC 3,963,015
188S 3,963,016

CLASS 124

21 3,963,017

CLASS 126

91A 3,963,018

CLASS 127

11 3,963,513

CLASS 128

2F 3,963,020
2T 3,963,019
145R 3,963,021
158 3,963,022
214F 3,963,023
214R 3,963,024
260 3,963,025
272 3,963,026
276 3,963,027
3,963,028
287 3,963,029
303.17 3,963,030
339 3,963,031

CLASS 130

27E 3,963,032

CLASS 131

170A 3,963,033
267 Re.28,858

CLASS 132

9 3,963,034

CLASS 133

2 3,963,035

CLASS 134

8 3,963,514
21 3,963,515
102 3,963,036

CLASS 135

45R 3,963,037

CLASS 136

6LF 3,963,516

27 3,963,517
83T 3,963,518
86A 3,963,519
107 3,963,520
134R 3,963,521
153 3,963,522

CLASS 137

99 3,963,038
118 3,963,039
344 3,963,040
410 3,963,041
468 3,963,042
487.5 3,963,043
490 3,963,044
505.13 3,963,045
565 3,963,046
596 3,963,047
596.17 3,963,048
614.18 3,963,049
625.66 3,963,050
637 3,963,051

CLASS 138

30 3,963,052
3,963,053
89 3,963,054
140 3,963,055
175 3,963,056

CLASS 139

2 3,963,057
3,963,058
137 3,963,060
436 3,963,059

CLASS 141

21 3,963,061
67 3,963,062
309 3,963,063

CLASS 144

309AC 3,963,064

CLASS 148

1.5 3,963,523
3,963,524
2 3,963,525
3,963,526
6.14R 3,963,528
6.2 3,963,527
20.3 3,963,540
25 3,963,529
31.5 3,963,530
3,963,531
37 3,963,532
108 3,963,533
133 3,963,534
144 3,963,535
171 3,963,536
175 3,963,537
3,963,538
3,963,539

CLASS 149

19.3 3,963,542
19.92 3,963,541
23 3,963,543
3,963,544
92 3,963,545

CLASS 151

41.76 3,963,065

CLASS 152

187 3,963,066

CLASS 156

69 3,963,546
79 3,963,547
88 3,963,548
193 3,963,549
252 3,963,550
295 3,963,551
299 3,963,552
304 3,963,554
305 3,963,553
358 3,963,555
423 3,963,556
519 3,963,557

CLASS 159

2E 3,963,558
4S 3,963,559

CLASS 160

348 3,963,067

CLASS 162

5 3,963,560
17 3,963,561
343 3,963,562

CLASS 164

278 3,963,068
282 3,963,069

CLASS 165

98 3,963,070
142 3,963,071
157 3,963,072

CLASS 166

105.1 3,963,073
206 3,963,074
241 3,963,075
278 3,963,076
315 3,963,077

CLASS 172

119 3,963,078
200 3,963,079

CLASS 173

105 Re.28,859

CLASS 174

36 3,963,854
40R 3,963,855
47 3,963,856
84C 3,963,857
141R 3,963,858
148 3,963,859

CLASS 175

9 Re.28,860
94 3,963,080
304 3,963,081

CLASS 176

19R 3,963,563
37 3,963,564
38 3,963,565
68 3,963,566

CLASS 177

210 3,963,082

CLASS 178

6.6R 3,963,860
3,963,861
3,963,862
3,963,863
3,963,864
7.1 3,963,865
7.2 3,963,866
69G 3,963,867
69.5TV 3,963,877

CLASS 179

1HF 3,963,868
15AT 3,963,870
15BA 3,963,871
15BS 3,963,869
18AB 3,963,874
18BD 3,963,873
18GF 3,963,872
27CA 3,963,875
81B 3,963,876
84VF 3,963,878
90K 3,963,879
100.41D 3,963,880
111E 3,963,881
115.5VC 3,963,882
179 3,963,883

CLASS 180

5R 3,963,083
26A 3,963,084
44R 3,963,085
51 3,963,086
64A 3,963,087
74 3,963,088
75 3,963,089
82C 3,963,090
108 3,963,091

CLASS 181

44 3,963,092
122 3,963,093
198 3,963,094

CLASS 182

2 3,963,095
15 3,963,096
76 3,963,097

CLASS 187

29R 3,963,098

CLASS 188

1C 3,963,099
79.5P 3,963,100
300 3,963,101

CLASS 190

51 3,963,102
52 3,963,103
58R 3,963,104

CLASS 192

98 3,963,105
3,963,106
109D 3,963,107

CLASS 195

28N 3,963,572
28R 3,963,571
29 3,963,573
30 3,963,574
31R 3,963,575
59 3,963,576
62 3,963,577
63 3,963,578
80R 3,963,579
103.5R 3,963,580
142 3,963,581

CLASS 197

1R 3,963,108
55 3,963,109
130 3,963,110

CLASS 198

37 3,963,111
72 3,963,112
193 3,963,113
203 3,963,114
208 3,963,115
213 3,963,116
227 3,963,117

CLASS 200

16D 3,963,884
52R 3,963,885
60 3,963,886
61.48 3,963,888
81.9R 3,963,889
83L 3,963,887
86.5 3,963,890
308 3,963,891

CLASS 201

2 3,963,582

CLASS 202

263 3,963,583

CLASS 203

38 3,963,585
49 3,963,584
96 3,963,586

CLASS 204

9 3,963,587
16 3,963,588
29 3,963,589
30 3,963,590
35N 3,963,591
98 3,963,592
3,963,593
129.95 3,963,594
158R 3,963,570
180P 3,963,567
181 3,963,568
206 3,963,569
258 3,963,595
3,963,596
277 3,963,597

CLASS 206

84 3,963,118
219 3,963,120
434 3,963,121
448 3,963,122
495 3,963,123
527 3,963,124

CLASS 208

8 3,963,598
11LE 3,963,599
59 3,963,600
111 3,963,601
3,963,602
164 3,963,603
211 3,963,604

CLASS 209

2 3,963,605
3 3,963,606
73 3,963,607
300 3,963,608

CLASS 210

7 3,963,609
21 3,963,610
63R 3,963,611
143 3,963,612
195R 3,963,613
198C 3,963,614
203 3,963,615
216 3,963,119
232 3,963,616
242S 3,963,617
256 3,963,619
279 3,963,620
321B 3,963,621
321R 3,963,622
401 3,963,623
500M 3,963,618
521 3,963,624

CLASS 211

126 3,963,125
131 3,963,126

CLASS 212

8R 3,963,127

CLASS 214

35R 3,963,128
86A 3,963,129
130C 3,963,130
140 3,963,131
142 3,963,132
3,963,133
145R 3,963,134
151 3,963,135
450 3,963,136
501 3,963,137
519 3,963,138

CLASS 215

204 Re.28,861
216 3,963,139
254 3,963,140
3,963,141
255 Re.28,862
346 3,963,142

CLASS 219

10.55M 3,963,892
69E 3,963,894
69R 3,963,893
125R 3,963,895
3,963,896
230 3,963,897
524 3,963,898

CLASS 220

64 3,963,143
85P 3,963,144

CLASS 222

5 3,963,145
59 3,963,146
95 3,963,147
132 3,963,148
142 3,963,149
211 3,963,150
309 3,963,151
402.13 3,963,152
541 3,963,153

CLASS 223

85 3,963,154
88 3,963,155

CLASS 224

1R 3,963,156
5D 3,963,157
31 3,963,158

CLASS 225

96.5 3,963,159

CLASS 226

115 3,963,160
150 3,963,161

CLASS 228

134 3,963,162
196 3,963,163
217 3,963,164

CLASS 229

8.5 3,963,165
14C 3,963,166
3,963,167
28R 3,963,168
3,963,169
40 3,963,170
42 3,963,171
44CB 3,963,173
44EC 3,963,172
80 3,963,174

CLASS 233

29 3,963,175

CLASS 234

48 3,963,176

CLASS 235

50B 3,963,899
61.11D 3,963,901
61.7B 3,963,900
92MP 3,963,902
144R 3,963,903
151.35 3,963,909
152 3,963,904
3,963,905
3,963,906
153AM 3,963,908
153B 3,963,907
156 3,963,910
3,963,911
189 3,963,912

CLASS 236

37 3,963,177

CLASS 239

8 3,963,178
101 3,963,179
288.5 3,963,180
404 3,963,182

CLASS 240

2AD 3,963,913
6.46 3,963,914
7.1R 3,963,915
52R 3,963,916
60 3,963,917

CLASS 241

76 3,963,181
88.4 3,963,183
101.1 3,963,184

CLASS 242

7.21 3,963,185
18R 3,963,186
55 3,963,187
55.19A 3,963,189
55.2 3,963,188
55.53 3,963,190
75.43 3,963,191
86.5R 3,963,192
107.4A 3,963,193
129 3,963,194
199 Re.28,863

CLASS 244

3.11 3,963,195
50 3,963,196
100A 3,963,198
148 3,963,199
153R 3,963,200
181 3,963,197

CLASS 246

34R 3,963,201
125 3,963,202
134 3,963,203

CLASS 248

27R 3,963,204
55 3,963,205
105 3,963,206
168 3,963,207
316A 3,963,208

CLASS 249

67 3,963,209
210 3,963,210

CLASS 250

223B 3,963,918
231SE 3,963,919
239 3,963,920
251 3,963,921
272 3,963,922
309 3,963,923
315A 3,963,924
338 3,963,925
3,963,926
3,963,927
361C 3,963,928
384 3,963,929
402 3,963,930
416R 3,963,931
445T 3,963,932
456 3,963,933
499 3,963,934
514 3,963,935
517 3,963,936
533 3,963,625
548 3,963,937
561 3,963,938
576 3,963,939

CLASS 251

85 3,963,211
145 3,963,212
306 3,963,213
326 3,963,214

CLASS 252

2 3,963,626
4 3,963,627
8.8 3,963,628
3,963,629
62.9 3,963,630
3,963,631
63.2 3,963,632
3,963,633
96 3,963,634
142 3,963,635
181 3,963,636
3,963,637
299 3,963,638
301.36 3,963,639
313R 3,963,640
373 3,963,641
3,963,642
442 3,963,643
455R 3,963,645
455Z 3,963,644
459 3,963,646
511 3,963,647
522 3,963,648
546 3,963,649

CLASS 254

26R 3,963,215
62 3,963,216
185R 3,963,217

CLASS 256

13.1 3,963,218
24 3,963,219

CLASS 259

107 3,963,220
180 3,963,221

CLASS 260

2.5F 3,963,650
3,963,651
3 3,963,652
4AR 3,963,653
5 3,963,654
17.4ST 3,963,655
18TN 3,963,656
28.5AS 3,963,659
28.5D 3,963,658
3,963,677
29.3 3,963,663
29.4UA 3,963,657
3,963,661
29.6WB 3,963,662
30.2 3,963,664
31.8C 3,963,665
37AL 3,963,668
37EP 3,963,666
3,963,667
40R 3,963,669
45.7R 3,963,671
45.75B 3,963,672
46.5G 3,963,673
67FP 3,963,676
75NE 3,963,679
75T 3,963,678
77.5AM 3,963,681
77.5NC 3,963,680
78UA 3,963,682
79.5A 3,963,683
112.5LH 3,963,691
125 3,963,692
154 3,963,693
3,963,694
210AB 3,963,695
210E 3,963,696
210.5 3,963,697
211.5R 3,963,698
234R 3,963,699
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9	:	240,280	25	:	240,281			240,294			

	240,307	35	:	240,288
	240,308	36	:	240,282
	240,309	56	:	240,289

PLANT PATENTS

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6	:	3,909			3,914			3,907		3,911	

3,912	3,913

U. S. GOVERNMENT PRINTING OFFICE : O - 1976

U.S. DEPARTMENT OF COMMERCE

Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, *Commissioner*